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High-Speed Greed

The more money a company makes, the larger it becomes. The larger it becomes, the greedier it gets. In this day and age, I don't think anyone would disagree.

Last month, I got a front-row seat to this phenomenon when I reviewed Motorola's Atrix 4G laptop/phone hybrid. It's an interesting device, and using it felt like a sneak peak at the future of computing. Unfortunately, the Atrix also served as the perfect mechanism for AT&T to screw me, all under the auspices of technological evolution.

The 4G network is AT&T's honey trap. If you currently have an unlimited data plan, you have to relinquish it in order to upgrade from 3G to 4G. Why? Because 3G network plans are incompatible with the 4G network, AT&T says. Uh, *riiiight*. After unsuccessfully trying to coax a more technical explanation about the incompatibility, I gave up. "OK," I said, "I'll give up my unlimited data plan. But if I decide to switch back to my original 3G phone, can I have it back?"

"Of course," I was told. "Just call us and we'll roll you back to your original plan." Lightning didn't strike, and because the rep sounded so sure, I acquiesced. In retrospect, I should have made sure she annotated my account with her reassurance of a rollback.

You probably know what's coming next. Two weeks later, I called AT&T to roll back my account. Oops. Actually, Mr. Jones, it turns out that it is impossible to revert back to an unlimited data plan. "The system won't let us do it," I was told. Nothing I said could turn the tide, not even the fact that I was previously told it was possible. "Sorry," the customer service manager intoned. "There's no record of that conversation."

I'm not the first person to get screwed by a 90/10 blend of greed and incompetence, but that sure doesn't make it feel any better. (You should have seen the first version of this editorial.) Oh, and don't forget: AT&T also provides high-speed Internet. This month's Quick Start lead story examines AT&T's institution of a new data bandwidth cap for high-speed service.

For now, the overage charges aren't steep, but over the next 10 years, bandwidth usage will continue to climb. What happens then? If we only have one or two choices, who's going to ensure we don't get screwed? Unless the feds step in—like they did with, um, AT&T, in 1982—I'm betting no one.

Agree? Disagree? Let me know. Finally, I have another contest challenge for you. This one's tougher than the pigs. In this month's Google cover story, one of Google's app icons is an impostor. The first 10 people to name the fake will get coined.

George Jones

MY TOP THREE STORIES THIS MONTH:

LETTERS POLICY Please send comments and questions to george@maximumpc.com. Include your full name, city of residence, and phone number with your correspondence. Unfortunately, George is unable to respond personally to all queries.



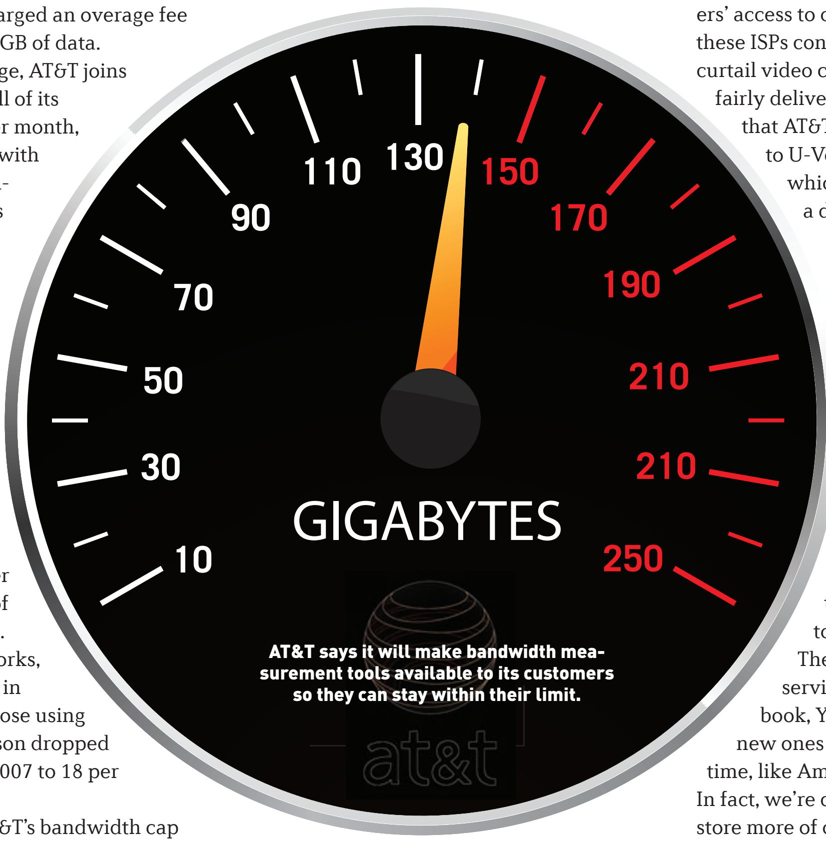
AT&T Institutes Bandwidth Caps

Is the change necessary to preserve network integrity, or a warning to cable cutters? —KATHERINE STEVENSON

Citing a need to curtail network congestion, AT&T is imposing bandwidth caps on all its broadband subscribers. Henceforth the ISP's DSL subscribers will be limited to 150GB of bandwidth per month, while U-Verse subscribers will be capped at 250GB. Customers who exceed the bandwidth cap more than three times during the life of their account will be charged an overage fee of $10 per additional 50GB of data.

In making this change, AT&T joins Comcast, which limits all of its subscribers to 250GB per month, as well as Time Warner with its 100GB cap. Like Comcast, AT&T is assuring its customers that the cap will affect just a very small percentage of its users—those who use "a disproportionate amount of bandwidth," which typically means peer-to-peer users. Interestingly, research firm NPD Group reports that P2P use is in decline. Its study found that in the fourth quarter of 2010 only 9 percent of Internet users in the U.S. used peer-to-peer networks, compared to 16 percent in 2007. What's more, of those using P2P, downloads per person dropped from 35 per quarter in 2007 to 18 per quarter in 2010.

Indeed, critics of AT&T's bandwidth cap point to the fact that claims of network congestion aren't backed up with data that can be validated: We just have to take the ISP's word for it. Furthermore, if congestion actually is an issue, the costs of relieving it can be relatively inexpensive, involving centralized upgrades to the ISP's multiplexer and backbone, as opposed to upgrading individual last-mile lines. Given that AT&T's wireline operating expenses are shrinking, according to public record, couldn't the company, which reported $20 billion in net profits for 2010, afford a bit more investment in its network?



Or maybe the caps have to do with another issue entirely: an issue known as Netflix. In March, an NPD Group study said Netflix owns 61 percent of the digital movie market share thanks to its Watch Instantly streaming service. Comcast's on-demand digital video takes a distant second place with 8 percent. And everything else falls behind that. Linley Group analyst Joe Byrne sees a connection: "AT&T, Comcast, Verizon, and the other large ISPs depend on their video services (U-Verse, Xfinity, FIOS, etc.) for profits and thus have a vested interest in limiting their customers' access to other sources of video. Hence, these ISPs concoct schemes such as caps that curtail video consumption under the guise of fairly delivering service." It's worth noting that AT&T says the cap will not apply to U-Verse subscribers' IPTV traffic, which the company says travels on a dedicated portion of the line.

If the caps aren't intended to thwart cable cutters, they raise still other questions. While it's true that very few people currently consume more than 250GB of bandwidth per month—or even 150GB, for that matter—is it farfetched to think that someday more of us could? Streaming a two-hour HD movie uses approximately 3.5GB of bandwidth, according to Netflix. TV shows use a third to half of that. No biggie, right? Then consider all the other online services we use regularly—Facebook, YouTube, Steam, etc.—and how new ones are being introduced all the time, like Amazon's tantalizing Cloud Player. In fact, we're continually being persuaded to store more of our stuff in and perform more of our activities on the cloud. Now multiply that usage by the number of people in your household. Suddenly it seems conceivable that AT&T is laying the groundwork for the majority of us to pay overage fees.



Innergie mCube Slim 95 Watt

Trying to cut down on the number of chargers and cables you have to pack? Consider Innergie's amazingly small but powerful mCube Slim 95 ($50, www.myinnergie.com). This universal PSU will put out enough power to replace a much larger 95 watt PSU, while also providing a USB charger port that puts out 1 amp. That's enough to charge today's hungry smartphones and tablets while powering your laptop, too. The unit comes with a set of interchangeable tips but if yours isn't included, the company will send you the correct one for free. **-GU**

OCZ Acquires Indilinx

Are the company's SandForce glory days over?

OCZ Technology, which recently dropped out of the DRAM market to focus on solid-state storage, proved it was serious and acquired Indilinx, the fabless chip maker responsible for Barefoot, the first really solid SSD controller, which ruled the roost until SandForce's SF-1200 debuted. This acquisition means OCZ now has its own in-house controller and firmware designers, which could give the company a competitive edge (though Indilinx's 6Gb/s controller has yet to materialize).

OCZ has had a very cozy relationship with SandForce, a primary Indilinx competitor, which netted the company exclusive high-performance firmware for its SandForce-based drives. How OCZ's Indilinx acquisition will affect that relationship remains to be seen. **-NE**

Indilinx's Barefoot controllers powered OCZ's first great SSDs.



Microsoft Slays Major Spam Bot

If you've noticed that the amount of junk email you receive is down lately, you can thank Microsoft. In a mission known as Operation b107, the company led a team that also included pharmaceutical giant Pfizer, network security firm FireEye, and U.S. federal agents in a months-long effort to take down the Rustock Botnet, which was responsible for billions of spam mails per day.

The team used both legal and technical methods to dismantle the Rustock botnet. Microsoft claimed that the botnet's code violated the Windows license agreement on multi-user remote sessions, committed trademark infringements, and violated the CAN-SPAM act.

In March, U.S. Marshals raided seven locations, seizing key command and control servers. With the C&C taken out, hundreds of thousands of PCs under the botnet's control simply stopped sending spam. With Rustock offline, spam analysis by Symantec's MessageLabs indicates a 33 percent drop in worldwide spam already.

This isn't the first time Microsoft has gone after a botnet. Last year the company successfully choked out the Waledac botnet by taking control of 277 domains that the botnet used to communicate. **-GU**

FAST FORWARD



Game Night at the Museum

No one should escape the deflating experience of suddenly feeling old by seeing something they once used now exhibited in a museum. ("Hey, I used to have a rotary landline telephone just like that!"). To bring this discomfort to younger folks than ever before, some enthusiasts in Silicon Valley are founding a Digital Game Museum.

That's right, someday you'll see Grand Theft Auto behind glass, and I don't mean the glass screen on your video monitor. This palace for the preservation of pixels will trace the history of electronic games all the way back to their roots—which may be deeper than you think.

The oldest videogame I've played is the original version of Spacewar! on a DEC PDP-1 minicomputer from 1962. No, I'm not quite that old. It was at the Computer History Museum in Silicon Valley, which restored a PDP-1 and gave me a try. (I demolished a kid who couldn't navigate the game's gravity well.)

Some founders of the Digital Game Museum were associated with the Computer History Museum, but the institutions are unrelated. The director recruited me for the museum's advisory board, even though I stopped playing electronic games 20 years ago. I was a videogame magazine editor in the 1980s, so my knowledge of the medieval days may be useful, especially when the museum begins assembling a magazine collection.

Are electronic games worthy of a museum? In the 1980s, it was widely believed that games were a new art form on the level of movies. Game companies began adopting the production flows, job titles, and terminology of Hollywood studios. But three decades later, I'm still waiting for the artistic equivalents of *Gone with the Wind* or *The Wizard of Oz*, to name just two classic movies released during the first three decades of Hollywood filmmaking.

In fact, no electronic games have yet achieved the timeless status of classic board games like checkers, chess, or Monopoly. (Tetris, maybe.) Perhaps electronic games are too inseparable from their fast-moving technology to endure. But their brief lifespans make preservation even more important. Electronic games generate much more revenue than movies and entertain millions of people, so they have earned a place in history.

Tom Halfhill was formerly a senior editor for *Byte* magazine and is now an analyst for *Microprocessor Report*.

GAME THEORY


THOMAS MCDONALD

The Passing of an Age

The influence and demands of console gaming weigh heavily on Dragon Age II. For PC gamers this is not a good thing. I feel like the word "streamlining" must have appeared in every design memo. You can almost hear BioWare thinking, "These kids today, they can't be bothered to move their rogue behind a target in order to properly execute a backstab. Let's do all that for them!"

Part of me gets it. Positioning party members can be a little fussy, so why not just cut that stuff out in order to get right down to the combat?

The other part of me thinks: Where does that end? Party management is one of the pleasures of party-based RPG combat. Once you remove the tactical aspects, what's left?

Not bloody much, it turns out. It ends with combat encounters that are little more than button-mashing cluster-frakking affairs sapped of any depth or nuance. It ends with the death of tactical role-playing at the hands of the company that perfected it.

But role-playing is more than combat. It's also character and narrative, and in those categories BioWare continues to do wonderful things. The richness of the dialogue engine and the way choices shape the narrative are amazing. Dragon Age II almost becomes a kind of lavish, fully voiced, wholly animated text adventure, with real people and events emerging from decisions that matter.

The shift from the epic questing of Dragon Age: Origins to the compressed political and urban intrigue of Dragon Age II is jarring, but it also allows the designers to explore characters and choices in a more focused, fulfilling way. It's a different kind of role-playing experience.

I'm still not sure if I like it. The combat seems to have been stripped of complexity purely to satisfy console gamers with short attention spans, not out of some high-minded decision to emphasize narrative choice. It's as though they're trying to create an action/RPG hybrid that appeals to a type of gamer who might not even exist.

Thomas L. McDonald is an editor at large for *Games* magazine and blogs at sopgaming.blogspot.com. You can follow him on Twitter at StateOfPlayBlog.

Google Backs Transparency

Company donates $1 million for tools to keep ISPs honest

Google caught a fair bit of flack for siding with the wireless carriers in the net neutrally debate, but in exchange, the company seems to be living up to its promise to protect the wired Internet. The search giant confirmed that it has awarded a $1 million contract to Georgia Tech researchers to develop simple tools to aid in the detection of Internet throttling, government censorship, and other "transparency" problems.

The funding is set to pay out over a two-year period, with an additional $500,000 extension possible if Google determines it's worth the additional investment. The Georgia Tech team intends to make these tools web-based, and available equally to everyone around the globe, across a variety of platforms such as PCs and smartphones. According to Professor Wenke Lee, these tools should help customers determine if they are actually getting what they're paying for, and just maybe, help keep our ISPs honest.

Google's no stranger to transparency issues. A week after announcing the donation, the company settled a case with the FTC over Google Buzz. When it debuted last year, the social networking service immediately came under attack for violating user privacy and employing deceptive tactics. As a result of the settlement, Google is barred from misrepresenting privacy settings and must obtain consent before sharing user information with third parties. **-JK**

Researchers at Georgia Tech envision a "transparency ecosystem," comprising smartphones and tablets as well as PCs.



WAITING GAME

Duke Nukem Forever Delayed, Again

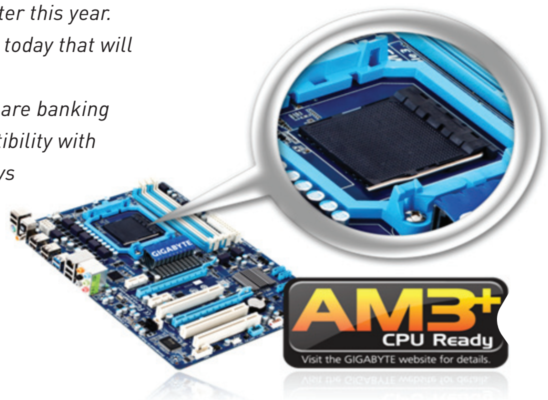
First-person shooter/perennial punch line Duke Nukem Forever, originally slated for release in 1998, has been delayed yet again. Gearbox announced in March that it was moving Duke's release date from May 3 to June 10, calling it the "shortest delay in the history of Duke Nukem Forever." We'll see. **-NE**



AM3 Ready for AM3+

It's no secret that AMD has a new AM3+ socket coming for its Bulldozer CPUs later this year. But what if you could get a board today that will work with Bulldozer?

That's what MSI and Gigabyte are banking on. Both have announced compatibility with Bulldozer in AM3 boards. MSI says three of its 890FX boards will work, while Gigabyte says it has 10 boards with "black sockets" that will be compatible. **-GU**

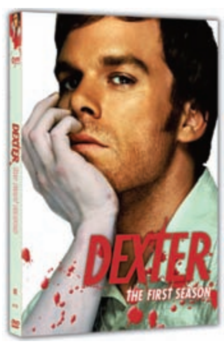


Netflix Grows, Steps on Toes

Company gets exclusive rights to original content

Despite its unparalleled success as a content delivery system, Netflix isn't resting on its laurels. The company recently won the exclusive rights to stream what's expected to be a hot new series: *House of Cards*, a political thriller starring Kevin Spacey. The series, backed by executive producer David Fincher, is a remake of a popular BBC miniseries from the 1990s. It will be available exclusively to Netflix subscribers in the U.S. and Canada in late 2012.

The deal marks a transition for Netflix and makes the company a direct competitor with the network and cable companies it has license deals with. It's clear feathers are already ruffled. Both Starz and Showtime announced plans to end the favorable streaming deals they currently have with Netflix. So while Starz had previously allowed Netflix to stream first-run movies and episodes of original series, such as *Spartacus*, at the same time they aired, those days are over. Showtime, for its part, will no longer let Netflix stream back episodes of series it's currently airing, such as *Dexter* and *Californication*. **-KS**



Showtime says Netflix can no longer show back episodes of its current series, like *Dexter*.

AMAZON LAUNCHES CLOUD

5GB of free storage space, music streaming via web or Android

In late March, with no fanfare, Amazon launched its Cloud Drive, giving Amazon account holders 5GB of free storage (with several tiers of paid storage available), as well as Cloud Player, which enables playback of user-uploaded media stored in Cloud Drive via web browser or Android app. Unlike some similar services, Amazon's Cloud Drive actually requires users to upload their own music and media, then plays exactly those files back—rather than scanning a playlist and streaming its own copies from a centralized server.

The music and movie industries were quick to complain about licensing, but Amazon says that since it's only streaming files uploaded by individuals back to those same individuals, it's not infringing on any copyrights and doesn't need to license content. By bypassing the labels, Amazon beats Apple and Google and others to the punch, but whether it will get away with it is another matter. **-NE**

BYTE RIGHTS



A New McCarthyism

Last year, more than 70 domains were seized by the Department of Homeland Security for copyright infringement and replaced with layered 1990s drop-shadow graphics so eye-bleedingly bad they may have violated the Geneva Convention. Some of those seizures were as legally questionable as the government's design sensibilities, targets of the copyright industry rather than real criminals. Rather than get shy about extralegal crackdowns, the New York DHS decided to double down. In early March it arrested one of the admins of a seized site, Brian McCarthy, for criminal copyright infringement. McCarthy ran Channelsurfing.net, which hosted no content of its own: It was a collection of links to sporting events hosted or streamed from elsewhere. No one claims McCarthy copied or distributed anything. Nevertheless, the government maintains that creating a linking website can carry a five-year sentence. What insanity is next? Page curl? The blink tag?

The idea is that he was inducing others to infringe, something the courts came up with as a civil law asterisk to copyright in 2005. It matters that McCarthy made a few thousand dollars every year from ads, and that he ran what was essentially a small business. But there's no direct law that makes linking to or inducing use of copyrighted material illegal. Such a bill even came before congress, and failed.

The court's interpretation was strictly about civil liability, which can only result in losing money. Arrest and jail takes criminal prosecution—a much higher standard. There's never been a case of criminal copyright inducement, until the DHS filed its case in New York. Investigators just made up a law the MPAA wanted. I don't want to imply that the New York DHS is a corrupt wing of enforcement for commercial copyright interests that is inventing criminal law to enforce an outdated business model... Oh wait, actually, I do.

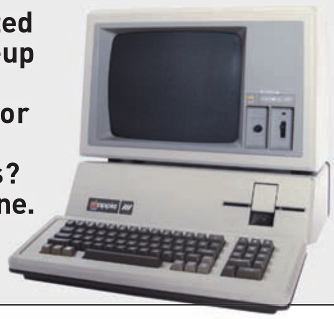
It turns out the entertainment industry helped the DHS make its lists, and the agency even announced a raid last year from Disney headquarters, on a stage next to MPAA executives. So keep an eye out for Hollywood's finest, coming guns drawn to a doorstep near you.

Quinn Norton writes about copyright for Wired News and other publications. Her work has ranged from legal journalism to the inner life of pirate organizations.

THE LIST
The 10 Biggest PC Failures

10 APPLE III

Who wanted a souped-up $7,000 Apple II for business purposes? Erm, no one.



9 APPLE LISA



ATARI FALCON030
8

A 32-bit CPU in a 16-bit data bus? Atari, sigh.

COLECO ADAM
7

It's a console system! It's a home computer! Actually, it's buggy and horribly designed.

6 COMMODORE 128

We didn't want a beefy, expensive dual-CPU system for business. We wanted... the Amiga.

5 OSBORNE EXECUTIVE

To this date, the Osborne Effect refers to a company obsolescing one product by pre-hyping another.

4 NeXT COMPUTER

Even though Tim Berners-Lee used one to create the world's first web server, Jobs's opus was still FAIL.

3 GO L MACH 3.8

This company's outrageous 2003 claims—5.0GHz systems, five-screen displays, and SSD—even pulled us into its hype vortex.

2 POWER MAC G4 CUBE

Cracks in Apple's fancy newfangled acrylic case enclosure doomed it from the start.

1 IBM PS/2

How ya' gonna' do it? PS/2 it! Or not. Consumers balked at IBM's attempt to regain control of the clone market by designing a proprietary system.



DEATHMATCH

Apple iPad 2 vs. Motorola Xoom

If you relied on the “experts” at the *Wall Street Journal*, *New York Times*, and *USA Today* for all your mobile tech advice, your purchasing decisions would primarily be guided by what’s cheap, what’s idiot-proof, and what’s light enough to spare your feeble hands from stress. We would allow these journalists their curmudgeonly biases, if not for the fact that their opinions spread virus-like across the infoscape, and influence people who might actually be rich enough, techie enough, and physically able enough for more feature-rich, high-performing wares.

So it’s time to set the record straight. The iPad 2 isn’t nearly as fantastic as the mainstream tech writers describe it, and the Motorola Xoom isn’t an also-ran, cowering in the iPad’s shadow. **–JON PHILLIPS**



Apple iPad 2
$730 (32GB/3G)
www.apple.com

ROUND 1

INDUSTRIAL DESIGN The iPad 2 is about 4 ounces lighter than the original iPad’s weight of 1 pound, 6 ounces. The weight decrease is appreciated, but c’mon, we’re talking about a quarter of a pound. The Xoom weighs the same as the original iPad, and we feel “heaviness” is a non-issue for all three tablets. The iPad 2 has a techier design than the Xoom, but the Xoom boasts a thinner black border around its screen. **WINNER: TIE**

ROUND 2

DISPLAY Tech enthusiasts released a collective “gah!” when Apple released the iPad 2 without a new, improved screen. Luckily, the original iPad screen is brilliant and accurate, and on a per-pixel basis, it’s brighter and offers truer colors than the Xoom’s display. Still, we were looking forward to a widescreen, HD update of Apple’s original 9.7-inch, 1024x768, 4:3 aspect ratio screen. The Xoom’s display is a 10.1-inch, 1280x800 LCD with a 16:10 aspect ratio. We prefer the higher resolution and movie-friendly dimensions that the Xoom’s display provides. **WINNER: XOOM**

ROUND 3

CAMERAS With its 5-megapixel, dual-flash camera and free, built-in video editing app (Movie Studio), the Xoom showed us that a tablet can be used to shoot and edit a polished video, all on a single device. The iPad 2 can do the same trick with its $4.99 iMovie app, but its rear camera, while spec’d as “HD,” offers pathetic image quality. The Xoom’s images, meanwhile, suffer fewer compression artifacts and boast much higher resolutions. As for front-facing cameras, each tablet’s offering is the requisite “good enough” for video chat. **WINNER: XOOM**

ROUND 4

RAW PERFORMANCE Both the iPad 2 and Xoom boast 1GHz, dual-core processors. Apple's is a Cortex A9-based system-on-chip with 512MB of RAM, while the Xoom's SoC is an A9-based Nvidia Tegra 2 with 1GB of RAM. Both tablets offer zippy, no-excuses performance in basic tablet functions. However, in the BrowserMark benchmark, the Xoom demolished the iPad 2 with a score of 93,241 to 69,032. The Xoom's extra half-gig of RAM will certainly come into play as more computer-like tasks are expected of tablets. **WINNER: XOOM**

ROUND 5

EASE OF USE The Apple tablet's desktop is cleaner, and leaves little room for ambiguity—because it really exposes nothing save for app icons. Similarly, the iPad 2's native apps honor simplicity over features and flexibility, and most technophobe users will probably more quickly intuit how to use them. The Xoom isn't "difficult" to use, per se, but its interface is more complex—a function of its emphasis on extended options and features. **WINNER: IPAD 2**

ROUND 6

FLEXIBILITY & CUSTOMIZATION For every slightly nonintuitive interface element that the Xoom's Honeycomb OS presents, you're rewarded with more customization and power-user options than you'll find in Apple's iOS. The iPad 2 buries various software options in its Settings app, while the Xoom makes them more readily available within each app's individual software interface. Honeycomb also lets you place interactive widgets directly on your desktop and supports Adobe Flash. Apple's iOS doesn't and never will. **WINNER: XOOM**



Motorola Xoom
$800 (32GB/3G)
www.motorola.com

ROUND 7

APP ECOSYSTEM The Android ecosystem includes about 300,000 apps. Apple's App store beats that by about another 50,000. That's a competitive margin of only some 16 percent, but most Android apps are crapware, while a higher percentage of iOS apps (if only because of Apple's restrictive approval process) tend to be more useful, polished, and robust. What's more, many of the world's truly awesome tablet apps are only available for iOS. The fact that so many iOS apps have been optimized for the iPad's larger display dimensions, while so many Android apps have not, only seals the deal in favor of iPad 2 for this category. **WINNER: IPAD 2**

And the Winner Is...

A tablet isn't worth squidly unless it's packed with great apps, and Apple's two iPads handily trump all Android-based devices in this arena. Nonetheless, we do find that the built-in apps that come free with the Xoom offer more features and flexibility than those that come stock on the iPad 2. Besides the free Movie Studio video editing app, the Xoom offers email, calendaring, web browsing, and Google searching apps that trump what comes stock on the iPad 2. All this, plus the Xoom desktop supports interactive widgets. Hardware-wise, a better screen, camera, and raw system power seal the deal in favor of the Motorola Xoom. At *Maximum PC*, we're not so interested in "easy." We're tech-enthusiast power users, and we want the most advanced, forward-thinking hardware that money can buy.

This month the Doctor tackles...

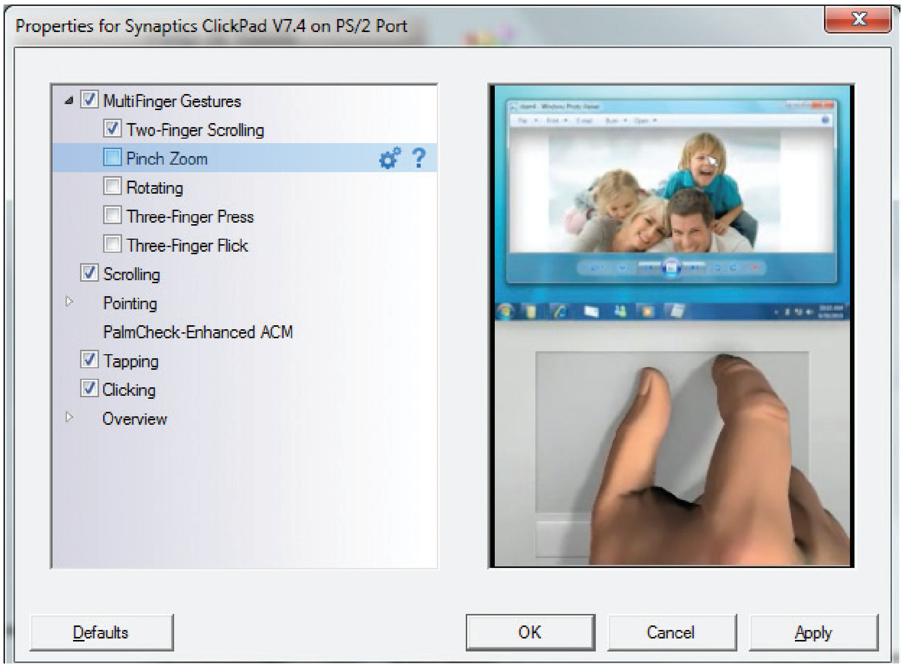
Busted PCI-E
HTPC Cooling
De-magnification

Busted PCI-E Slot

My secondary computer runs an EVGA nForce 780i SLI motherboard. Last week, the monitor stopped displaying video from the GPU. After ruling out cable issues, I moved the DVI cable from the first videocard to the second (in PCI-E x16 slot 3). Now the screen says, "A single videocard is detected in PCIE X16_2 or PCIE X16_3. Please move the graphics card PCIE X16_1 slot for non-SLI operation." The videocard in slot 1 is functional, as is the one in slot 3, and switching them gives the same result, so it seems to be an issue with my PCIE X16_1 slot. How do I make my motherboard use the second or third PCI-E slot as its primary, since slot 1 is broken?

—Tommy Grenier

Although many motherboards include a BIOS setting that lets you choose which PCI-E slot to use as your primary slot, the EVGA nForce 780i does not. With the 780i chipset, you can't use PCIE X16_2 or _3 as your primary graphics card slot, which means if your first slot is burnt out, you're out of luck. The good news is that it looks like the nForce 780i SLI board carries a limited lifetime warranty, so contacting EVGA for an RMA is your best bet.



Synaptics multitouch trackpads' pinch-zoom function can inadvertently trigger Windows Magnifier.

De-Magnification

I just bought a new laptop PC, an HP Pavilion dv7-4270us. It has an AMD Phenom II P960 quad-core mobile processor, which is listed with a 1.8GHz speed.

Is the rated speed of 1.8GHz the actual overall speed of the CPU? I have a quad-core CPU in my desktop (also an AMD Phenom II) and it is rated at 3GHz. Why is the quad-core in my laptop rated so low?

The Magnifier program keeps popping up while I am using the computer. It is very annoying! HP was not able to disable it or tell me how to do it. Do you have any suggestions on how I can disable (or even remove) the Magnifier program?

—Jim Higley

Let's tackle your questions one at a time. First, yes, your new laptop's quad-core is 1.8GHz, while your desktop's is 3GHz. Mobile processors are nearly always less powerful than desktop procs, for several reasons. Mobile processors need to be small (to fit into the machine) and be fairly miserly with power (because they run on battery). Fast CPUs require more electricity and output more heat, both of which are easier to deal with in a desktop than a notebook.

To disable Magnifier, go to the Control Panel and, under Ease of Access, select Optimize visual display. Scroll to the bottom and uncheck Turn on Magnifier. That should do it. We have a hunch, though, that your multitouch trackpad is to blame. Go to the system tray, right-click your Synaptics Pointing Device and select TouchPad Options. Under MultiFinger Gestures, uncheck Pinch Zoom, and click OK. This should prevent the trackpad from turning Magnifier back on.

Server 2008 Instead of Windows 7?

My Windows XP rig is on its last legs, and I'm contemplating a new rig. A business

associate suggested running 64-bit Windows Server 2008 R2 instead of Windows 7. He would even give me a fully licensed copy. I have been poking around the Internet and have found a lot of alleged success stories about running Server 2008 as a workstation, but all the articles are a few years old. I want all the bells and whistles of Windows 7 (Aero, for example). Also, this is my day-to-day PC so it needs to be able to run Quicken and Windows Media Center, as well as play games.**

Should I go with the free copy of Server 2008, or shell out $139 for an OEM version of Windows 7 Pro?

—Brett Mitchell

While it's hard to argue with free, it's important to note that Server 2008 is optimized for, well, servers, rather than home machines, and thus will prioritize CPU usage differently. Though you can get Aero and other desktop-like perks pretty easily from within the Control Panel, you're out of luck for others—like Windows Media Center. Given that you explicitly mention that functionality in your email, you ought to opt for Windows 7 over Server 2008 R2.

HT(LC)PC?

I can't seem to decipher much useful information about water cooling my HTPC. I keep the machine near my TV and I do not have central air—or much cooling in the summer at all—and I do a lot of encoding of home videos, so my HTPC tends to get quite warm. When encoding, the CPU tends to run between 55 C and 61 C, while the north bridge is usually a steady 59 C – 63 C. When gaming, my GPU can get up to 63 C. There is also an overabundance of dust in my house. My HTPC chassis is an Apevia X-Master-BK/500, my CPU is a Core i5-760, and the GPU is a GeForce GT 240.

—Gordon Colson

First of all, your temperatures do not sound unreasonable given your rig's power and placement. HTPCs often run warm, placed as they typically are in cabinets full of other hot AV gear, so liquid cooling your HTPC might seem like a no-brainer. But the same factors that make your HTPC run hot in the first place—including limited airflow—can actually be a good reason *not* to liquid cool. Adding a liquid cooler to your CPU will undoubtedly lower your CPU temperatures, but it might actually raise the temperatures of your mainboard and GPU. The CPU fan usually helps to also cool the motherboard (by forcing air to keep moving around it), and if you remove that fan and put a radiator in front of one or more of the intake fans, you'll lessen what little airflow your components get. Of course, you could just get more powerful fans, but that'll increase your noise—usually not a good thing in an HTPC. If you don't mind the noise, more powerful fans, like Scythe's Gentle Typhoons (www.scythe-usa.com), would be an effective solution, and maybe some dust filters to keep dust out of your chassis.

ADDING A LIQUID CPU COOLER CAN ACTUALLY RAISE THE TEMPERATURE OF YOUR MAINBOARD AND GPU



A PCI-E SSD can be just the ticket if you're looking to go beyond SATA 3Gb/s speeds without replacing your motherboard.

PCI-E SSD or SATA 3Gb/s?

I have been debating upgrading to a solid-state drive, but can't decide whether I should go for the OCZ RevoDrive X2 240GB or wait for the OCZ Vertex 3 or another next-generation SandForce drive. I'm using an Asus M4A79 Deluxe motherboard, so I don't have any 6Gb/s SATA ports. I've also heard that some users have had problems booting from the RevoDrive on certain Asus motherboards, and that it might affect PCI Express bandwidth when using multiple graphics cards. What would you recommend?

—Andrew Costa

Andrew, if you don't have 6Gb/s SATA and don't plan on upgrading your motherboard soon, you don't need to wait for the Vertex 3 or another 6Gb/s drive—you'll be capped at around 250MB/s by the SATA 3Gb/s bandwidth limit; a first-generation SandForce drive will be fine, and cheaper.

We couldn't find your motherboard on the RevoDrive compatibility list on OCZ's website, but OCZ was able to find and test a M4A79 Deluxe for us, and after a few days of testing they determined that, yes, the Asus M4A79 Deluxe can boot from the RevoDrive without any problems. For best results, they say to use your blue X16_3 slot and update your BIOS first.

The good news about your board is that it runs on the 790FX chipset, which has plenty of PCI-E bandwidth. You should have no problem running two GPUs and a RevoDrive.

SUBMIT YOUR QUESTION Are flames shooting out of the back of your rig? First, grab a fire extinguisher and douse the flames. Once the pyrotechnic display has fizzled, email the doctor at doctor@maximumpc.com for advice on how to solve your technological woes.

POWER UP GOO

a complete guide to: 49 of google's apps and services X Search

a complete guide to: **undercover tricks for the most popular apps**

a complete guide to: **10 future google labs projects**

a complete guide to: **google apps you've probably never heard of**

a complete guide to: **life with our new digital overlords**

About 5,400 words (11 pages)

Advanced Users only

By Robert Strohmeyer

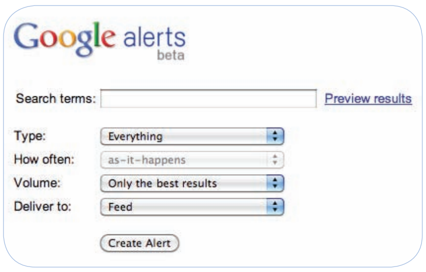
IF IT'S TRUE THAT GOOGLE IS SET TO TAKE OVER THE WORLD, WE SHOULD PROBABLY ALL GET TO KNOW OUR ONLINE OVERLORD A LITTLE BETTER. AFTER ALL, THE MOUNTAIN VIEW GIANT MOVES MORE THAN 65 PERCENT OF THE WORLD'S SEARCH TRAFFIC, AND DOMINATES THE REST OF THE WEB WITH A BROAD SWATH OF FREE SERVICES. SINCE IT'S ALMOST IMPOSSIBLE TO GET THROUGH A DAY ON THE INTERNET WITHOUT CROSSING GOOGLE'S PATH, WE'VE CREATED THIS COMPREHENSIVE GUIDE TO ALL THINGS G.

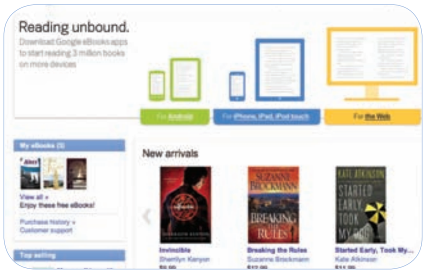
39 GOOGLE APPS THAT MATTER

We break down and evaluate the most essential Google services and offer helpful tips for the most important ones

Google Alerts

Want to know what people are saying about you (or anything else, for that matter) on the web? Set up a Google alert. Type any search string into the field—the more specific, the better. Be sure to use an exclude operator (-) to cut out common words that are likely to clutter your results with false positives. Or, if you're only looking for results from a few common sites, follow your search term with the "sites:" operator, listing the sites you are interested in after the colon. Next, narrow your results further by selecting the type of content you want alerts about, such as news, blogs, or video, frequency you'd like to run the search, and the address you'd like results sent to.
google.com/alerts



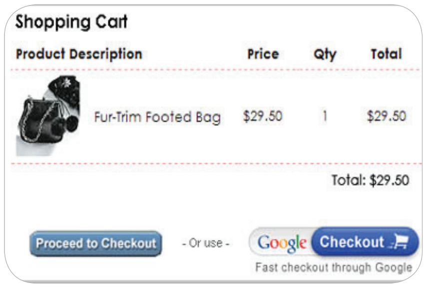


Google Books and eBookstore

Thanks to the Kindle, Amazon has made digital books commonplace. Now Google is working to make them ubiquitous with Google Books and eBookstore. A convergence of two distinct services, Books is a massive collection of scanned volumes served up as PDFs as well as ebook files from books and magazines on even the most obscure topics dating from the 19th century to the present day. The eBookstore sells current releases at prices comparable to those of Amazon and Apple's iBooks. The service now pairs with reader apps on Android, iOS, and the desktop.
books.google.com

Google Checkout

On the heels of PayPal's breakout success, Google jumped into the online payment game with Checkout, a basic payment service that lets you buy stuff online via a credit card linked to your Google account. Like PayPal, Google Checkout securely automates payments on a wide range of retail sites, including tech retailers like TigerDirect.com. In typical Google fashion, Checkout buttons are now integrated directly into Google ads and search results, urging users to make one-click purchases just about everywhere in Googleland. A word of advice: Linking your credit card account to your Google account gives you even more reason to keep your password ultra-secure.
checkout.google.com



EXPLORE MORE WITH GOOGLE EARTH

Five easy ways to see more of the world with Google's interactive globe

Mark Your Places

Google Earth is loaded with cool data, but to make it personally relevant, you should add your own places to it. To add any location to your list of places, punch the address into the Fly To field to zoom to it, then right-click the crosshairs on the map and select Save to My Places.

Work with Layers

All data in Google Earth is presented in layers laid over the base map. Major cities and other frequently visited locales will tend to house dense layers of data. You can make the map more navigable and useful by enabling or disabling layers of data. For instance, if you're trying to get a feel for the layout of a city you're about to visit, but the map is covered with little data points for all the pictures people have uploaded to Google Earth, uncheck the box for the Photos layer to get a clearer view. To see what the climate is like in the location you're viewing enable the Weather layer.

Check Out the Gallery

At the top of the Layers box you'll find a button marked Earth Gallery, which will take you to a large collection of additional layers you can add to your app. Some of them are really practical, like the near-real-time snapshots of active flights in the U.S., which can actually help you locate your inbound flight or track a friend's flight. Others are just plain awesome, like the Shipwrecks layer that shows you the exact locations of known shipwrecks.

Add Geotagged Photos

You can add your own photos to Google Earth's Photos layer by geotagging them in Picasa and exporting them to a KML file that you can open in Google Earth. To contribute your pics to all Google Earth users, up-



Google Maps

Google has emerged as the leader in online mapping. Integrating conventional street maps with comprehensive, surprisingly up-to-date satellite imagery, flyover images, 3D cityscapes, traffic alerts, and street-level views of even the most outlying suburban neighborhoods, Maps can give you a pretty accurate picture of just about any spot on the planet.
maps.google.com

Google Apps for Business

For business users, Google offers a multi-service package known as Google Apps Premier Edition. Consisting of slightly tweaked versions of Gmail, Google Docs, Sites, and an additional selection of services from the Google Apps Marketplace, this enterprise-grade suite of tools runs $50 per user per year. Unlike standard Google accounts, which work with all Google services, Google Apps business accounts support a relatively narrow selection from Google's collection. As a trade-off, however, they support a broad array of third-party business plugins.
google.com/apps

Search

GOOGLE SEARCH POWER TOOLS

Find what you're looking for with Google's core toolset

Once upon a time, search was all Google did. Life was simpler then, and Google Search's simplicity beat out the growing bloat of rival Yahoo in the span of a year. Does anyone ever say, "Let me Yahoo that for you"? No, they don't. The Search feature set is constantly changing, but generally consists of six integrated services.

Web Search
To get the most out of Google Search, it's still best to familiarize yourself with the engine's operator strings, such as quotes to find an exact phrase, "site:" to search only a specific site, or "–" to exclude a term from your results. You can also use the Advanced Search interface to add criteria like reading level, language, file type, and date, and turn SafeSearch (the content-filtering option) on or off.
google.com

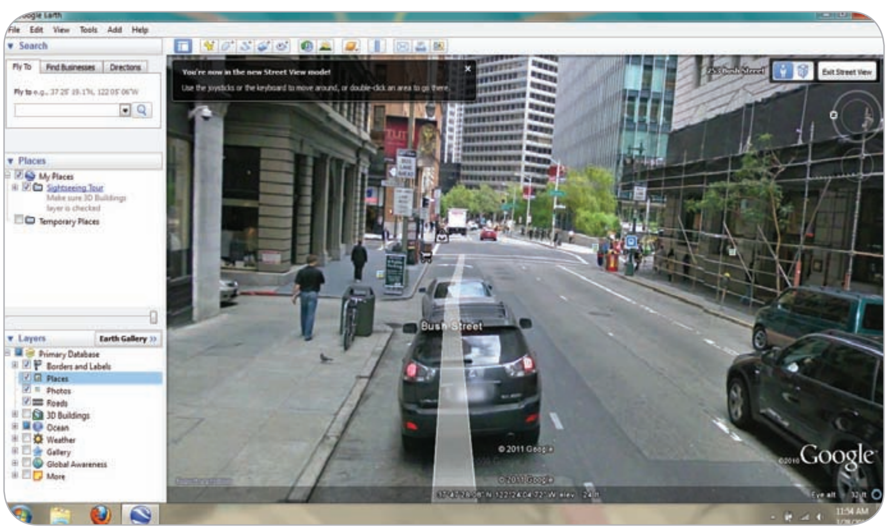
Image Search
As its name implies, Image Search scours the web for pictures that match your search string. The results appear as a cascading page of thumbnails that enlarge when you hover over them. To narrow results, use the options in the left sidebar to select a size range, image type, or dominant color.
google.com/imghp

Video Search
Like Image Search, Video Search looks only for online videos that match your string.
video.google.com

Google Directory
Google Directory is a throwback to the early days when sites were indexed by category and presented in a browsable topic tree. It's an absurd way to surf the 21st-century web.
google.com/dirhp

Google Trends
Looking for stats on what the world is searching for? Google Trends tracks the most popular search terms to give you a barometer of what's hot on the web. It's very handy for search engine optimization.
google.com/trends

Custom Search
Whether you're a blogger or a business with a large site, you can add Google's search engine to your pages with Custom Search. Enter your site's URL and Google will give you some code to embed on your site, complete with text autocompletion in the search box (if you enable it). The free version includes Google ads in the results. An ad-free version is available for $100 per year.
google.com/cse



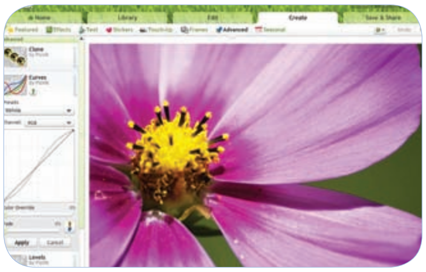
load them to Panoramio in Picasa and, if Google approves, they'll eventually appear in Google Earth's Panoramio layer.

Add Your Own 3D Buildings
Google Earth includes 3D models of significant buildings in many major cities, and you can add your building to the map with Google Building Maker (google.com/buildingmaker). Based on SketchUp, Building Maker lets you select a building in Google Earth, then drag shapes onto the image to line up the various facets of the structure. When your 3D model is complete, submit it to Google for approval to have it added to Google Earth.

Google Earth now includes Street View images wherever they exist on Google Maps. Just zoom down to street level to activate them.

Picnik

If you think downloading and installing Picasa on the desktop seems like too much effort, try Picnik, a simple online photo editor that Google bought last year. Upload a photo to Picnik and you can auto-fix lighting problems, crop, resize, adjust colors and exposure, remove red-eye, and share the finished product via Flickr, Facebook, Twitter, Photobucket, MySpace, and of course, Google Buzz and Picasa Web Albums. A basic account is free, and a premium account adds a truckload of additional features for between $2 and $5 per month (depending on the subscription term).
picknik.com



Translate

Paste or type any text into Google Translate's text box, and the service will detect the language it's written in, then translate it into one of more than 50 languages, complete with an awkwardly robotic audio transcription.
translate.google.com

YouTube

YouTube needs no introduction. It precedes Google's ownership, and led the company to kill off its own Google Video service after the buyout. If you've ever uploaded or watched a video online, you've almost certainly used YouTube.
youtube.com



Google Latitude

Built on Google Maps, Latitude is a location-sharing service for mobile devices. Install the app on your phone, and you can invite your friends to share their locations with you (and vice versa) in real time. It's a fun idea, and useful for families and companies that want to keep track of their people, but also deeply creepy and stalkery. Everyone we know who's ever tried Latitude disabled it long, long ago.
google.com/latitude

Panoramio

If Picasa Web Albums and Google Maps had a tawdry little fling, their progeny would be Panoramio, a simple photo-sharing site built around Google Maps. In short, it collects and displays photos taken at specific locations, so you can explore pictures from around the world in Google Maps or Google Earth. Upload a pic and Panoramio will ask you to select the location where the photo was shot. If you enable location tracking with Google Latitude, Panoramio will use Latitude's location history to match the time the photo was taken in an attempt to pinpoint the photo location automatically. It's a kludgy setup, and one that's easily foiled by an incorrect time setting in your camera. Panoramio is still in its infancy, and it's not at all clear that Google has figured out what to do with it yet.
panoramio.com



GOOGLE VOICE SECRETS

Six ways to turn Google Voice into the ultimate digital receptionist

Set Your Schedule

If you use your Google Voice number for business, or just don't want to be disturbed at certain times, you can set custom days and hours when the service won't ring your phone. Click the Settings icon in the top-right corner of the window and choose Voice Settings. Then click Edit under the phone you want to set hours for, and click "Show advanced settings." Under Ring Schedule, you can either choose a preset schedule or click "Use a custom schedule" to set the time range that works for you.

Go Lite

Rather not give up your existing mobile number to get Google Voice's transcription and voicemail features? Use Voice Lite. During sign-up, just click "I want to use my existing mobile number instead," and you'll get the essential features without another number to remember. Note: This feature will port your mobile number from your wireless carrier to Google Voice.

Record Incoming Calls

To start recording an incoming Google Voice call, press 4 at any time during the call. The recording will be saved to your Google Voice inbox for later retrieval. Sadly, this feature isn't available for outbound calls.

Annotate Your Voicemails

Want to jot a few notes about a voicemail so you can refer to them later when you call the person back? Click More at the bottom of the voicemail bubble and then choose "Add note."



Google Talk

Google's entrant in the instant messaging arena is Google Talk, which lives mainly within Gmail but also appears on iGoogle pages and the Orkut social network, as well as in a stand-alone desktop version. Google Talk integrates with AIM accounts, but works best with other Google Talk users, enabling video and audio chat through the Gmail interface. Oddly, the desktop version doesn't support video, though—so if you use Gmail regularly, that's typically the best option for Google Talk.
google.com/talk

Orkut

Now in its seventh year, Orkut never gathered much traction with American users, but remains huge in Brazil and India. It's basically a Facebook clone.
orkut.com

GOOGLE NEWS AND INFO SERVICES

Search services for research, investing, news, and more

These services will let you dig a little deeper into specific topics or dimensions of Google's wide-ranging information services.

Google Reader

Regardless of where you get your news, Google Reader is an indispensible RSS feed aggregator, with mobile versions for Android, iPhone, BlackBerry, Symbian, and Windows Mobile.
reader.google.com

Google News

For quick access to news from all over the web, Google News is tough to beat. It collects stories on hot topics into clusters, often bringing hundreds of sources together into a single cluster to help you find a multitude of perspectives on the day's news. Unfortunately, many news sites now target hot Google News topics so aggressively that it can turn any given topic cluster into an echo chamber, but the multisource approach is great.
news.google.com

Blog Search

Google Blog Search does for blogs what Google News does for news sites.
blogsearch.google.com

Google Scholar

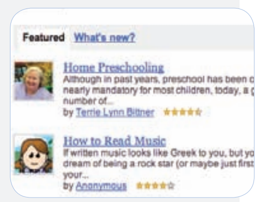
If you're doing scholarly research, Google Scholar should be on your list of reference sites. It weeds out general web content to focus strictly on scholarly journals to give you sources worth citing.
scholar.google.com

Google Finance

Doing some investing? Google Finance is a one-stop shop for market analysis and business news.
finance.google.com

Knol

Like Wikipedia, Knol is a user-created reference site with articles on just about everything. Unlike Wikipedia, Knol is poorly monitored for the veracity of its content. While the site has attracted the contributions of some real experts in their fields, much of Knol's content is mind-bogglingly incoherent.
knol.google.com

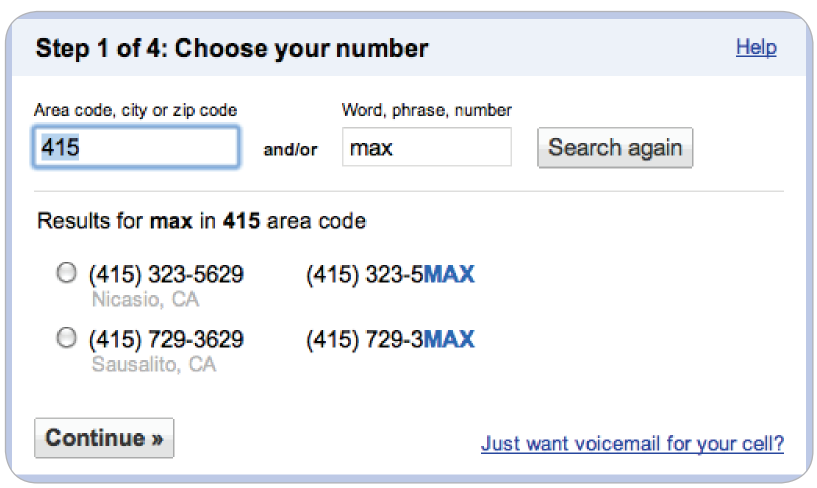


Change Your Number

Getting too many annoying calls on your Google Voice number? Change it. Just click Port/Change next to your number at the top of the window, and choose "I want to get a different Google Voice number."

Turn on 'Do Not Disturb'

Need an hour or two of peace? Enable Do Not Disturb by clicking Settings, then Calls, and check the radio button for Enable "Do Not Disturb." Choose the amount of time you want calls to go straight to voicemail, and your phone won't ring during that time.



When you select a Google Voice number, you have the option to choose a number containing an acronym.

Google Health

As part of an industry-wide push to move health records online, Google Health aggregates all of your medical information in a single, Googley interface. You can input your vitals, such as blood pressure, weight, vaccinations, and so on, and import medical records from 25 different pharmacies and healthcare providers. The idea is to give you an easy way to track your healthcare and share information with your physician. Whether you really want to trust all this information to Google is another matter entirely.
health.google.com





Blogger

If you blog at all, you're probably familiar with Blogger. Google's blogging service is the sixth-largest in the world, serving up blogs to some 400 million active readers worldwide. In recent years, Blogger has been looking a little stale compared to competitors like WordPress and Drupal, but Google has been hard at work revamping the service with a new template designer, real-time stat tracking, mobile-friendly templates, and other welcome updates. At press time, the new features had yet to launch, but they'll be worth a closer look when they go live.
blogger.com

Google Groups

Google's earliest foray into the world of social networking was Groups, which it bought and rebranded in 2001. It's a massive collection of user-created forums on just about any topic. Very little differentiates Google Groups from Yahoo Groups or any of the other online forum sites. You can join an existing group, or start your own.
groups.google.com

Google Buzz

In yet another attempt to make headway in the social media game, Google launched Buzz in May 2010. Early adopters immediately pounced on the service, which is integrated directly into the Gmail interface. Buzz had been heralded by Google as a smarter approach to social networking that would reduce unwanted noise in your social stream and surface the most relevant posts from your best buddies. In reality, it did almost exactly the opposite. Most early adopters quickly abandoned the service citing concerns over privacy and usability.
google.com/buzz

POWER UP GOOGLE CALENDAR

Five essential productivity tricks



Google Calendar is so straightforward, its basic features need very little explanation. But you can supercharge your productivity by adding these awesome tools from Google Calendar Labs. Click the little green flask icon in the top-right menu to get started.

Event Attachments

Premium calendar apps like Outlook let you attach documents to scheduled events so everyone has the same materials for the meeting. By default, Google Calendar doesn't. But if you enable this handy Lab extra, you're in business.

Automatically Decline Events

Whether you're taking a vacation or just want to block off a few hours as a no-meetings zone, this add-on saves you the trouble of having to manually turn down meeting invitations when you're unavailable.

Smart Rescheduler

Always getting invited to meetings at times when you're already booked? Use Smart Rescheduler to automatically analyze your group's schedules and find a time when everyone can make it.

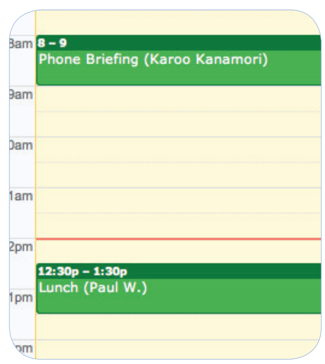
Dim Future Repeating Events

When your schedule's really packed, it helps to clear the view a little. This Labs add-on renders next Thursday's weekly status meeting in a lighter shade than other events so you can focus on less mundane stuff.

Who's My One-on-One With?

Someone invited you to a meeting and inconsiderately named it "Call with you." Why do people still do this? No matter. Enable Who's My One-on-One With? to automatically display the names of people you have meetings with to the right of the event name.

The Who's My One-on-One With add-on from Google Calendar Labs helps you fill in the blanks when your event descriptions are less than descriptive.



AD OCZ

GOOGLE PLATFORMS: ANDROID, CHROME, AND GOOGLE TV

Google pushes beyond the cloud with mobile, desktop, and embedded platforms

A few years ago, you might have been forgiven for doubting Google's ability to threaten Microsoft's OS dominance. But now that the company is aggressively branching out into traditional Redmond territory, the competition is heating up.

In the span of two years, Google's Android mobile operating system has managed to do what Microsoft couldn't: go toe-to-toe with Apple's iPhone. Android is currently neck-and-neck with iOS in smartphone market share, and the platform's app selection is growing fast. Many analyst projections show Google leading the smartphone market within the year, thanks to its multidevice strategy of open development, and the new 3.0 Honeycomb release could signal gains on tablets.

Meanwhile, the Chrome browser has gained roughly a quarter of the global browser market, further eroding Internet Explorer's slice of the pie chart. And, while it's still very much in development, the browser-only operating system known as Chrome OS shows that Google has its eye on unseating Windows from the desktop environment.

Constantly hedging its bets, Google has begun a push into the living room with Google TV, an embedded OS for surfing the web from your couch. If you've been keeping up with *Maximum PC*, you know that we haven't been impressed by the first generation. Whether this platform will succeed or fade into obscurity like MSN TV remains to be seen, but the surge of app-driven HDTVs this year could give it a boost.

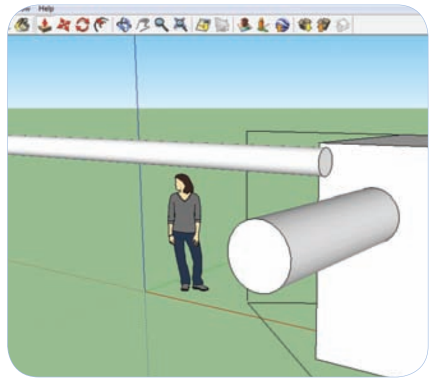


Picasa Web Albums

Despite the name, Picasa Web Albums is more than just an online extension of the Picasa app. It's more like Google's answer to Flickr (which we're pretty sure lost its relevance a year ago). With or without the desktop app, Picasa Web Albums gives you a gigabyte of online storage to share photos and videos. Unfortunately, a gig isn't a lot of space for pictures, so it won't be long before Google starts pressuring you to upgrade your storage to 20GB for $5 per year. Is that a lot of money? No, it's not. Is it enough of a hassle that you'll just want to stick to Facebook for photo sharing? Yes, it is.

picasaweb.google.com





SketchUp

An interesting departure from Google's standard fare, SketchUp is a free 3D modeling tool that's insanely easy to use. Even with no background in graphic design, you can start creating 3D graphics in just a few minutes by simply drawing a shape, pulling it into three dimensions, and then drawing more shapes. Google provides more than 100 how-to videos on the SketchUp site to help you get started and master the tools.

sketchup.google.com

iGoogle

Remember when web portals were all the rage, and everyone was supposed to have a personalized home page preloaded with news, weather, email, and whatever else? Yeah, iGoogle is a holdover from that era.

www.igoogle.com

TRICK OUT GMAIL

Seven serious efficiency secrets for managing your inbox

Use Hotkeys

Mousing around your screen like a newb is no way to get things done. Gmail supports a variety of hotkeys to help you navigate through messages quickly, and you can enable them near the top of the Settings menu. At the very least, you should be using the K and J keys to move up and down your conversations list, R to reply, and C to compose a new message.

Canned Responses

Tired of typing the same message every time someone asks you the same question? The Canned Responses add-on in Gmail Labs lets you prepare a variety of messages that you can insert by clicking a little drop-down in the editing menu. It's also good for folks who use more than one email signature.

Send & Archive (at once)

The Send & Archive feature in Gmail Labs is one of the simplest timesavers you'll find. As its name implies, it sends your reply and archives the conversation with one click.

Google Storage

If you need more storage for any of your Google services, Google abides (for a price). A 20GB upgrade costs $5 per year, 80GB will cost you $20, and so on, with options all the way up to 16TB for $4,096 a year. Your upgraded storage becomes available to all of your various Google accounts, in addition to your free quotas on each service, so you can load up your Picasa Web Albums with as many pics and videos as you can afford the space for.
google.com/accounts/b/0/PurchaseStorage

Picasa

Easily one of the best free photo tools anywhere, Picasa has evolved from humble beginnings into a robust photo editor complete with organization features, advanced editing tools, and built-in sharing options. During installation, Picasa will sweep your hard drive in search of images, and integrate them into its photo browser to get your pictures under control. From there, you can open them up, autofix problems, fine-tune lighting and effects, export your pics to a blog, create a collage, or quickly create a slideshow video to upload to YouTube.
picasa.google.com

OVERCLOCK GOOGLE DOCS

Five ways to work smarter with Google's online office apps

Connect to Microsoft Office

Prefer to work in Microsoft Office but want the sharing features of Google Docs? Yeah, us too. Google Cloud Connect is a simple Office plug-in for Windows that automatically syncs your documents to Google Docs as you work.



Manage Collections

Once you've been using Docs for a while, your Documents List will become massive and unnavigable. To make files easier to locate even when you can't remember what you named them, use Collections. They're basically just folders, but Google seems to want to have a different name for everything. You can share entire collections with other Docs users to make collaboration easier.

Go Mobile

Google Docs lets you edit documents from a phone with Android 2.2 or later, or iOS 3.0 or later, installed. No need to download third-party apps. Just browse to docs.google.com and you're in. If you're using some other kind of phone, try using Documents To Go.

Talk About It

Collaborating with a colleague on a document? When you're both viewing it at the same time, you can start a chat session by clicking their name in the upper-right corner of the window. Alternatively, just use the comments feature, which—thanks to a recent upgrade—now acts more like an IM session.

OCR Your Image Files

Google Docs can now scan PDFs and image files for readable text when you upload them, turning them into fully searchable, editable documents. Just check the radio button for the "Convert text from PDF or image files to Google Docs documents" option in the upload menu, and select the appropriate language from the drop-down.

Signature Tweaks

Why does Gmail insist on putting your signature after the quoted text in your reply? We don't know. But we don't put up with it, either. Enable the Signature Tweaks add-on in Gmail Labs to place the signature above the quoted text, where it belongs.

Make the Icon Column More Visible

Google places little icons to the right of the message subject line in your inbox, but half the people we talk to never seem to know about it. To make these icons more useful, move them to the left of the subject by enabling the Move Icon Column feature in Gmail Labs.

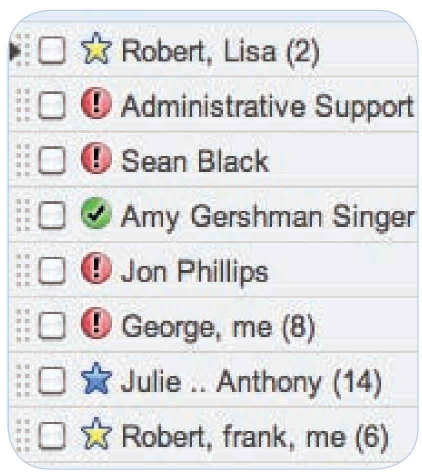
Superstars

It's nice to be able to set messages apart by clicking a little yellow star, but once you've clicked a few hundred of those stars, the significance begins to fade. The Superstars Gmail Labs add-on gives you as many as 12 different icons in place of that single yellow star. What you use them for is up to you.

Silence Conversations

Some guy you don't know is leaving the company, and your inbox is rapidly filling with the insincere farewells of a few hundred well-wishers. Use the Smart Mute add-on in Gmail Labs to automatically bypass your inbox on future messages in that thread.

The Superstars add-on in Gmail Labs gives you up to 12 different icons with which to mark your messages.



THE 10 COOLEST APPS IN GOOGLE LABS

Like living on the edge? These awesome experimental apps will give you a glimpse into Google's future—or fade from memory like Google Wave

10

Search Keyboard Shortcuts

Often the best ideas turn out to be the simplest ones. Just as Gmail supports hotkeys for faster navigation through your inbox, the experimental Search Keyboard Shortcuts adds several useful hotkeys to your search results view. The shortcuts themselves are similar to those in Gmail: J and K move your cursor up and down the list. O or Enter open a result. / puts your cursor in the search box, and Esc removes the cursor from the search box.

9

Aardvark

Got an obscure question that none of your friends can answer? Ask Aardvark, and it'll use accumulated profile data to find the best person to send your question to. Aardvark claims to answer most questions within 10 minutes.

8

Short URL for Google Maps

Want to share a map with a friend? Enable the Short URL feature in Google Maps Labs and it'll convert the contents of the Link menu into a short goo.gl address that won't take up all your character count on Twitter.

7

Android App Inventor

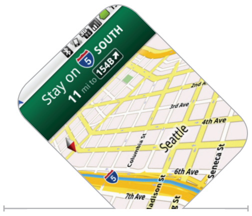
Want to break into the mobile development game but lack actual programming skill? No problem. Google's App Inventor gives you simple building blocks that you can drag and drop to create your own simple apps. You can work directly with your own phone over USB or use the tool's Android phone emulator to work entirely on the web. When you're done, package the app and load it onto any Android device you want.





Google Aardvark claims answers to most questions within 10 minutes.





WalkyTalky for Android

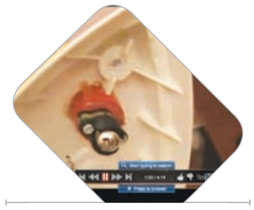
Want to use Google Maps on your Android phone without actually looking at the device? WalkyTalky is an experimental app that makes Google Navigation more useful for walking directions by verbally guiding you and speaking street addresses to you as you pass by them to give you a clearer idea of where you are.

6

Open Spot for Android

Looking for a parking spot on a busy downtown street? The Open Spot app for Android might just give you an edge. The idea is that users who are leaving their spots are supposed to mark their location in the app so that users who need a spot can find it. Each time you mark a spot, you'll get karma points, which are exchangeable for nothing at all but can give your ego a boost.

5



YouTube Leanback

Leanback is just a massive video window that automatically runs through a sidescrolling list of preselected popular videos. You can use your mouse or keyboard to move between them, but the best way to navigate is by using your Android phone as a remote.

4

Google Scribe

You're already accustomed to using autocomplete in search fields. Why not take the next step? Google Scribe is an odd little app that attempts to autocomplete everything you type. Start typing anything, and Scribe will attempt to complete not only the word itself, but also the rest of the phrase. Once you get a few characters on the screen, keep hitting Enter to let Scribe compose its own text. The resulting text might not be useful, but it's a fascinating process to watch.

3



Google Squared

Forget Wikipedia. Google Squared lets you compile your own information page about any given topic. Just type a search term (say, "Disneyland") into the field and click Square It. Squared will then grab information from a variety of online sources and arrange them in a grid with pictures.

2

1 ONE UNO EINS

GOOGLE GOGGLES

Explore the world through your smartphone's camera

Typing is so 20th century. Google Goggles is a mobile app for Android and iPhone that lets you search based on pictures. Launch the app, take a picture, and Google Goggles will figure out what to do with it. On Android, Goggles is a stand-alone app, and on iPhone it's now built into the Google Search app. Here are a few cool examples of what Goggles can do.

Scan a Business Card

Take a picture of a business card and Goggles will analyze the text so you can call the person, email them, and add them to your contacts.

Find a Book or Product

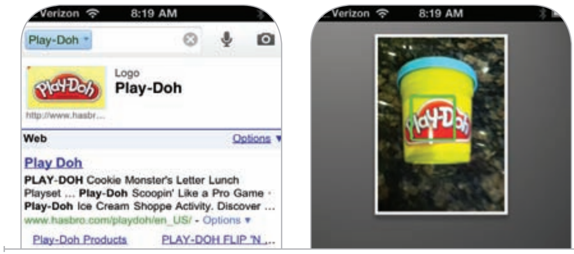
Take a picture of a book or product and Goggles will search for it on the web so you can buy it, download it, or just get more information from the manufacturer's site.

Explore Landmarks

Shoot a landmark, like a bridge or a building, and Goggles will compare it to other images online to tell you what you're looking at, map it for you, and give you quick access to navigation information.

Discover Art

Whether you're at a museum or a poster shop, Goggles can take a picture of a painting or sculpture and identify it by name, tell you who created it and when, link you to scholarly works about it, or help you find a reproduction to buy.



So this is that Play-Doh stuff
all the kids are talking about.

BY NATHAN EDWARDS

SSD GRAND PRIX

BREAKING THE 250MB/S BARRIER WITH NO MOVING PARTS



1

OCZ VERTEX 3 240GB

Will the new SandForce SF-2200 controller in the Vertex 3 dominate the field the way its predecessor did? The other SSDs here hope not.

2

CRUCIAL M4 256GB

The same drive that Micron is selling to OEMs with the RealSSD C400 moniker, the Crucial m4 is the follow-up to the C300 6Gb/s SSD.

3

INTEL 510 250GB

In a surprise move, Intel enters the 6Gb/s field with a third-party controller—the same Marvell 9174 powering all but one of the drives here—instead of one of its own.

4

PLEXTOR M2 SERIES 128GB

Plextor has yet to make a name for itself in the SSD market after debuting with the unimpressive M1S. Perhaps the new Marvell 9174 controller will help it out.



If the automotive world progressed as fast as the computer industry, the old joke goes, we'd all have $1,000 cars that get 400 miles to the gallon, never need maintenance, and crash catastrophically every eight weeks for no reason. Ancient punch lines aside, comparing this year's storage options to those of even half a decade ago would be like entering a Bugatti Type 35 in the Preakness Stakes.

Half a decade ago, we were all still chasing the fastest mechanical hard drive. Today, solid-state drives are where the action is. And the progress made in SSDs over the past three years has been staggering. During our first SSD roundup in November 2008, the cream of the crop offered sustained-read and -write speeds on par with a mechanical drive, at 20 times the cost, and most were much worse.

In 2009 and 2010, the first really excellent consumer SSDs arrived, powered by Indilinx's Barefoot controller, SandForce's SF-1200, as well as Intel's and Samsung's proprietary controllers. 2011's crop of controllers brings 6Gb/s SATA support, enabling much faster transfer speeds. Some are also using smaller-process NAND. Marvell's 9174 controller (the one from last year's Crucial C300) powers three of the drives in our roundup, while the fourth is the first SF-2200 drive we've been able to get our hands on. Where's the best bang for your buck? Does 6Gb/s SATA really make a difference? And who would ever buy a horseless carriage?

DRIVE ONE

OCZ VERTEX 3
240GB

First of the next batch of SandForce drives



VERDICT 9
$540
www.ocztechnology.com

OCZ retains the solid-state crown with stellar overall performance.

Some amount of wheeling and dealing got OCZ access to special firmware for its last-gen SandForce drives, enabling faster random-write performance than the competition. Despite OCZ's recent acquisition of Indilinx, it seems there's still a spark to OCZ's relationship with SandForce, as the company was able to get us an SF-2200 drive before anyone else. Since the Vertex 3 is the first SF-2200–powered SSD we've tested, we don't know how it compares to the rest of the SF-2200 field, but we do know it kicks the pants off of most every other SSD we've reviewed.

The Vertex 3 uses 25nm-process NAND and, like all SandForce drives, no cache. That SF-2200 controller really cooks, setting records in most of our benchmarks and performing competitively in the rest. No single drive in our roundup matches the Vertex 3 on all fronts, though the Crucial m4 is close in random read/write performance and the Intel 510 comes close to its sequential reads and surpasses its sequential writes. OCZ continues its tradition of blazing-fast random-write performance, both at low- and high-queue depths, serving up more than 85,000 IOPS in our Iometer QD32 4KB random-write test. That's nearly 80 percent faster than the Vertex 2, the previous SATA champion.

It's too early to tell whether the rest of the SF-2200 lineup will be able to compete with OCZ's Vertex 3. But for the few weeks until we get our hands on more next-gen SandForce drives, the Vertex 3 reigns supreme.

HOW WE TESTED

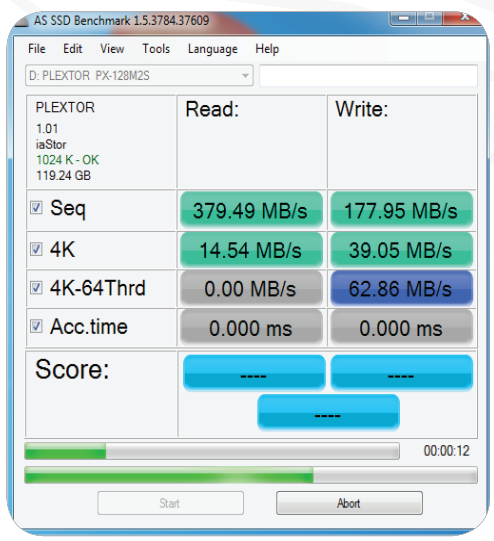
New hardware, new software for our most comprehensive SSD tests ever

Regular readers of our drive reviews might notice a few changes in our benchmark chart on page 39. HDTune and HD Tach, the low-level drive benchmarks, are gone, replaced by CrystalDiskMark, AS SSD, and ATTO. Several factors played into this decision. First, the low-level benchmarks work on the raw disk level, on unformatted and unpartitioned drives. This is useful on rotary drives, but less so on solid-state ones. CrystalDiskMark and AS SSD are designed from the ground up to test solid-state storage at the partition level, which better mirrors real-world use. AS SSD's 4KB low-queue-depth random benchmark gives results that match well with HDTune's, while CrystalDiskMark's 32QD 4KB read and write benchmarks parse well with Iometer's, giving another level of robustness to our storage tests. ATTO shows read and write speeds for a wide array of different block sizes; we use 64KB as a good middle-of-the-road benchmark. Premiere Pro and PCMark Vantage, as real-world tests, remain in our toolbox.

We still ran HD Tach and HDTune on all the drives in this review, but the end results were not as useful as those from CrystalDiskMark and AS SSD.

We've also moved our SSD test bed to a Sandy Bridge motherboard—Asus's P8P67 Pro with the B3 chipset. Our previous test bed was based on the X58 chipset, which used a Marvell 6Gb/s SATA controller. The P67 chipset's native Intel 6Gb/s offers better, more stable 6Gb/s SATA performance.

AS SSD is built from the ground up to measure SSD performance.



DRIVE TWO

CRUCIAL M4
256GB

Company debuts second 6Gb/s SSD



■ VERDICT **9**
$500
www.crucial.com

At first blush, the Crucial m4 seems virtually indistinguishable from its predecessor, the Crucial RealSSD C300. After all, it's available in the same capacity with the same Marvell 9174 6Gb/s SATA controller and same amount of DRAM cache—256MB for the 128GB, 256GB, and 512GB versions, and 128MB for the 64GB drive.

That isn't to say the Crucial m4 is identical to the C300. For one thing, the m4's firmware has been substantially updated from the sometimes-flaky firmware of the C300. For another, the m4 uses 25nm-process NAND, while the C300 used 34nm NAND. Smaller-process NAND means lower cost per gigabyte (thus, cheaper SSDs), but with a slight durability hit, albeit one probably unnoticeable to the end user.

In our tests, the m4 (and every drive in this roundup) positively smoked our best-of-the-best 3Gb/s SATA drive, the OCZ Vertex 2—sustained-read and -write scores as measured by CrystalDiskMark and AS SSD were more than twice the Vertex 2's scores, and the m4 scored higher 4KB random reads and writes across the board, from single-queue depth to QD 32. The 256MB of cache doubtless helped the m4 in PCMark Vantage's HDD subtest, where it posted the highest score we've seen from a non–PCI-E drive. The m4 doesn't have the fastest sustained speeds, but its random-access speeds are top-notch. And 400MB/s reads and 250MB/s writes would have been unthinkably fast a couple of months ago.

The Crucial m4 represents a great implementation of the Marvell 9174 controller, and a great demonstration of the advantage of native 6Gb/s SATA.

What's the difference between the Crucial m4 and a Micron RealSSD C400? Branding.

DRIVE THREE

INTEL 510
250GB

Intel's new SSD, powered by... Marvell?



■ VERDICT **8**
$614
www.intel.com

Nobody panic. Intel is still coming out with its much-delayed third-generation solid-state drive. The 320 Series will use 25nm NAND and Intel's latest controller, on 3Gb/s SATA, and will focus on what made Intel drives great: high read speeds and random writes, and rock-solid reliability. Intel, recognizing that 250MB/s read speeds ain't gonna cut it in 2011 (and holy cow, do we love typing that), is also bowing to popular demand and releasing an SSD with 6Gb/s SATA capability, but rather than design its own controller for that, Intel is using a third-party component. Intel wouldn't officially tell us which controller, but thanks to the mysterious and powerful technology known as screwdriver, we can say with confidence that it's Marvell's 88SS9174-BKK2.

Intel's 510 Series SSD uses 34nm Intel NAND chips and 128MB DDR3 DRAM cache—and, of course, the same 6Gb/s Marvell 9174 controller as the Crucial and Plextor drives. The 250GB model that we tested showed the strongest sustained-write speeds of any drive in our roundup—more than 300MB/s—and its sustained reads of more than 480MB/s bested every Marvell-based drive. But its 4KB random-read and -write speeds, at any queue depth, were good by 2009's standards, but no match for Crucial's offering or either of the last- or current-gen Vertex drives.

If you go solely by sequential-read and -write speeds, the Intel 510 is one of the fastest drives we've ever tested, but its random-read and -write performance lags far behind the front-runners. By splitting its SSD line into two segments (3Gb/s SATA, random-write-centric versus 6Gb/s, sequential-speed-centric), Intel risks having two less-than-compelling options. And in a crowded field, consumers might not go with either one, especially given the jaw-dropping $614 street price of the 250GB 510 Series SSD.

Intel's 510 SSD isn't part of the same family as its X25-M drives, but it's special in its own way.

DRIVE FOUR



PLEXTOR M2 SERIES

128GB

Second verse, better than the first!

■ VERDICT 7
$300
www.plextor.com

Plextor's M2 series manages to up the company's SSD track record from abysmal to middlin'.

We'll say this for the Plextor M2 Series SSD: It's a huge step up from Plextor's last SSD. The M1S Series SSD we tested in our June 2010 roundup used Marvell's "Da-Vinci" 88SS8014-BHP2 controller, which suffered from instability and slow writes. We gave that drive a 5 verdict. To our great relief, the M2 series SSD instead uses Marvell's newer 6Gb/s SATA controller, the 88SS9174-BLD2—marking the third appearance of a Marvell 9174 controller in this roundup.

With the M2 series, Plextor pairs the Marvell 9174 controller with 128MB of DDR3 DRAM cache, and the result is an undeniable improvement over its previous-gen drive. As reported by CrystalDiskMark and AS SSD, sustained reads hover near 400MB/s, with sustained writes around half that. That's around double the read speed of the OCZ Vertex 2, but 25MB/s slower than the Vertex 2's write speed. 4KB random reads and writes also suffered in comparison to the Vertex 2.

The Plextor M2 is much better than Plextor's last SSD, and in many benchmarks it's superior to last generation's top drives—mostly in read speeds. But its write speeds and random-access times lag behind the other 6Gb/s SATA drives in our roundup, and even high-performing drives from last year. The M2, like Plextor's last drive, comes with a copy of Acronis True Image Home to ease your transition from a smaller or slower drive, which is nice.

If you're shopping for your first SSD, Plextor's M2 makes a decent offering. But it's not the best of what's available in the 6Gb/s SATA SSD market—or even the best Marvell-controlled drive.

TODAY'S DRIVES, YESTERDAY'S MOTHERBOARDS

Even if you're stuck with 3Gb/s SATA, these drives can be worth it

Are you contemplating buying a brand-new solid-state drive, but worried that your motherboard is draggin' you down? Even if your motherboard has no 6Gb/s SATA ports (or, like many X58 boards, has a crappy onboard 6Gb/s SATA controller), you can still benefit from running a 6Gb/s SATA drive.

See, most last-gen drives had to deal with the 3Gb/s SATA interface, which tops out in the real world at around 250MB/s, so there was no incentive to push performance. But 6Gb/s drives don't have that limitation—they're built to far surpass it. And though you won't see 400MB/s read speeds on a 3Gb/s SATA port, you can still push closer to the 3Gb/s barrier with a current-gen drive than you can with a last-gen one.

We tested OCZ's Vertex 3 6Gb/s SATA drive on our test bed's 3Gb/s SATA controller, and found that it far surpassed the Vertex 2 that was our previous champion, offering sustained-read and -write speeds around 260MB/s and 220MB/s, respectively. Even constrained by the 3Gb/s SATA interface, the Vertex 3 matched or bested the Vertex 2 in nearly every benchmark (see the chart on the next page).

The performance difference on 3Gb/s SATA isn't so great that you should upgrade to a current-gen SSD if you're already rocking a SandForce 1200, Intel, or Samsung drive and you don't have 6Gb/s SATA ports available. But if you're in the market for your first SSD and still rocking a last-gen motherboard, don't rule out 6Gb/s SATA drives. If your current mobo can't take advantage of all that speed, your next mobo can. Or you can grab a PCI-E-to-6Gb/s SATA host bus adapter, like HighPoint's Rocket 600 series, to get 6Gb/s SATA on your current board.

POST-RACE WRAP-UP

Team SandForce maintains dominance in a field of strong performers

We've been anxiously awaiting the SF-2200 controller for a while—could the company that sprung out of stealth mode to take the solid-state drive market by storm in 2010 pull a repeat in 2011? Though we're still a few months away from seeing multiple vendors shipping SF-2200 drives, if the performance of the OCZ Vertex 3 is any indication, it's going to be another good year for SandForce.

The SandForce-powered OCZ Vertex 3 is the clear winner of our little roundup, posting race-winning scores in virtually every benchmark. In CrystalDiskMark and AS SSD, which are solid-state-specific synthetic benchmarks, the Vertex 3 posted average sequential reads of 500MB/s and average writes of 280MB/s, second only to the Intel 510. In queue-depth 32 4KB random-read and -write benchmarks (both CrystalDiskMark and Iometer), the Vertex 3 again bested the rest of the field, though Crucial's m4 SSD came within spitting distance of OCZ's drive. PCMark Vantage, which mirrors real-world applications, actually gives the top spot to Crucial's m4 SSD, with the Vertex 3 a close second.

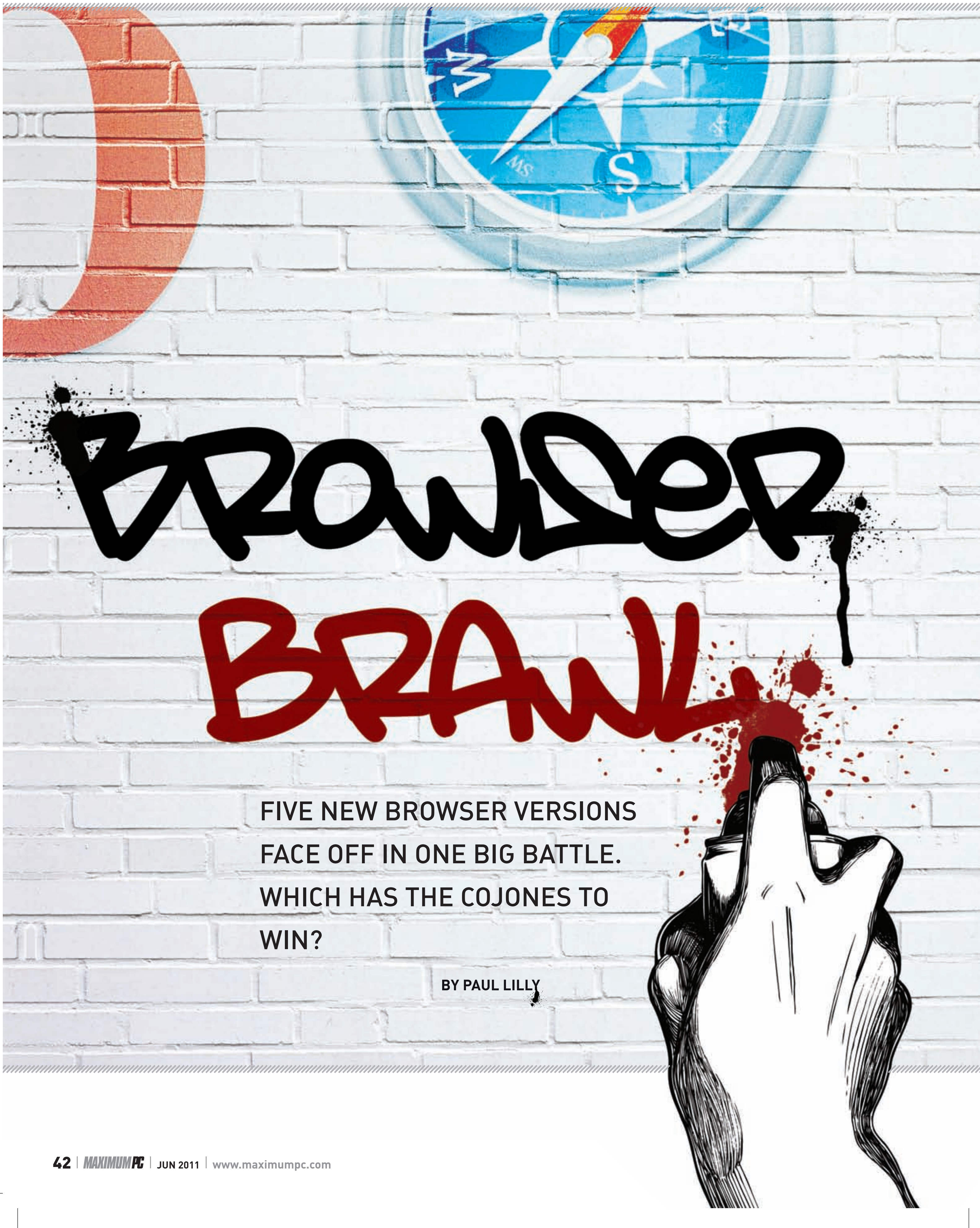
One interesting result our testing shows is the importance of good firmware. Three of the drives in our roundup share the same Marvell 9174 controller (albeit with varying amounts of cache), but they all post different benchmark results. Intel's 510 shows the strongest sequential-read and -write scores by far, but its random-access scores are no better than those of the Plextor M2. Crucial's m4, on the other hand, shows random-read and -write speeds almost as high as the Vertex 3, but its sequential speeds were much lower than the Intel or OCZ drives. Intel's and Crucial's offerings each excel in at least one area, while the Plextor M2 is competent compared to last-gen drives but unexceptional compared to this generation.

We should make explicit that any of these solid-state drives deserves your purchasing consideration. They're all powerful performers that really take advantage of the increased bandwidth of the 6Gb/s SATA bus. Depending on your needs, either Crucial's or Intel's drives should be near the top of your list, though the OCZ Vertex 3 combines the best features of each—for a price.

Benchmarks

	 OCZ Vertex 3	 Crucial m4	 Intel 510	 Plextor M2	 OCZ Vertex 2 (6Gb/s SATA)	 OCZ Vertex 3 (3Gb/s SATA)
Capacity	240GB	256GB	250GB	128GB	100GB	240GB
Controller	SF-2200	Marvell 9174	Marvell 9174	Marvell 9174	SF-1200 (6Gb/s port)	SF-2200 (3Gb/s port)
CrystalDiskMark						
Sustained Read (MB/s)	**485.5**	404.5	480.1	415.2	206.2	269.6
Sustained Write (MB/s)	289.8	257.3	**328.9**	197.5	87.92	228.4
4KB Random Read, 32QD (MB/s)	**171.2**	167.9	80.02	75.58	111.1	166.2
4KB Random Write, 32QD (MB/s)	**247.4**	235.8	49.7	47.72	81.56	182.8
AS SSD						
Seq. Read (MB/s)	**506.2**	407.73	483.6	387.33	208.46	262.77
Seq. Write (MB/s)	280.19	249.73	**308.03**	186.67	71.7	218.84
4KB Random Read (IOPS)	**5,539**	5,091	4,674	3,729	5,249	5,213
4KB Random Write (IOPS)	**14,263**	13,837	9,923	9,961	12,910	12,302
Read Access (ms)	0.157	**0.105**	0.207	0.232	0.13	0.168
Write Access (ms)	0.222	0.278	**0.095**	**0.093**	0.235	0.209
ATTO						
64KB File Read (MB/s)	446.5	284.9	**449.2**	391.3	257.6	253.9
64KB File Write (MB/s)	**505.3**	260.2	341.5	216.9	269.1	264
Iometer						
4KB Random Write, 32QD (IOPS)	**85,144.43**	56,087.81	12,123.95	13,169.8	47,647.11	46,655.39
Max Access Time (ms)	**61**	143	318	576	30.2	52.37
Premiere Pro Encode/Write (sec)	**422**	429	424	438	443	433
PCMark Vantage x64 HDD	59,978	**61,758**	39,053	37,792	42,290	38,281

Best scores bolded. Our current test bed is a 3.1GHz Core i3-2100 processor on an Asus P8 P67 Pro (B3 chipset) running Windows 7 Professional 64-bit. All tests used onboard 6Gb/s SATA ports with latest Intel drivers, except 3Gb/s SATA tests, which used onboard 3Gb/s Intel SATA ports.



Browser Brawl

FIVE NEW BROWSER VERSIONS FACE OFF IN ONE BIG BATTLE. WHICH HAS THE COJONES TO WIN?

BY PAUL LILLY



The last time *Maximum PC* played host to a knock-down, drag-out dogfight for the browser crown, it was predominantly a two-way scuffle featuring Mozilla's spunky Firefox browser, then in version 2.0, versus Microsoft's revitalized Internet Explorer, which had just been updated to IE7. We ultimately declared Firefox the winner, but that was four years ago, which, in computer years, is an eternity. Boy how things have changed since then, and at the same time, stayed the same.

For starters, Internet Explorer still claims the largest share of the browser market. This has been the case for more than a decade now. Firefox, meanwhile, has maintained its rank as the world's second-most-used browser and remains a fan favorite among enthusiasts.

But there's also now a third contender vying for browser dominance. We're of course talking about Google Chrome, which didn't even exist four years ago. That's OK, because Chrome has had little difficulty making up for lost time. Now in version 10, Chrome's expanded feature set and growing popularity have earned it the right to go up against IE9 and Firefox 4. These are the latest and greatest among the "Big 3" browser makers, and what's at stake is not just bragging rights, but piles of advertising dollars and control over emerging web standards.

Our goal is to figure out which of these three is the best vehicle for navigating cyberspace. We'll be paying particular attention to new features, security, privacy, and, of course, performance. We'll even throw in a few power-user tips for each one. And for those of you who roll with Opera and Safari, don't worry, we'll cover the latest versions of those, too. Let's take this to the streets!



GOOGLE CHROME 10

Sleek, fast, and one version short of awesome

It's hard to imagine now, but Google CEO Eric Schmidt initially wanted no part of the "bruising browser wars," or so he told the *Wall Street Journal* in 2009. Co-founders Sergey Brin and Larry Page did, however, and they hired a few Firefox developers to build a concept version of Chrome. Schmidt was instantly convinced Chrome could be a game changer, and less than three years after its introduction, its market share sits in double-digits. Chrome follows an aggressive release schedule and the version we're looking at here is Chrome 10 (final).

WHAT'S NEW?

Google didn't invent the web browser, but it did popularize the concept of a minimalistic interface. Chrome 10 retains this bare-bones approach and takes it a step further by eliminating the Page button. Now the Wrench icon sits by itself to the right of the Omnibar.

Other changes are just as subtle. The Options menu now opens in a tab and includes an awesome search function. Type "password," for example, and you're presented with a bunch of related options and privacy settings, which would normally appear on separate pages. Also new to Chrome 10, you can synchronize passwords, not just other items, between various computers.

SECURITY

Chrome has always been big on security, and version 10 includes dozens of patches. It also updates automatically and disables outdated plugins so you're never rocking a compromised build, so long as you restart Chrome when prompted.

Google expanded Chrome's sandboxing feature to wrap around the browser's integrated Adobe Flash Player plugin. This is important, because Flash seems to be attracting more attention from hackers lately. It took a collaborative effort from Adobe and Google to put Flash in a sandbox, adding an additional layer of protection by isolating it from the OS.

PRIVACY

If you steer clear of thunderstorms because they're too risky with your tinfoil hat, then you're probably worried Chrome is just another vehicle for Google to track your every move. The disclaimer that Chrome "only communicates with Google services where absolutely necessary to deliver features and functionality" probably doesn't help, but Google points out that you can disable features that require this.

We also applaud Chrome's Incognito private browsing mode which, unlike Firefox's, can be run in a separate browser window simultaneously with a regular browser window.

PERFORMANCE

In addition to popularizing the concept of a minimalistic browser UI, the other thing Chrome is known for is speed. Chrome 10 kicked it up a notch with its retooled CrankShaft JavaScript engine and ran circles around the other browsers in the majority of our JavaScript-specific benchmarks. It reminded us of that scene where Superman circles the Earth to reverse its rotation.

Unfortunately, Chrome 10 lacks GPU-assisted acceleration, at least by default. Even when enabled—which entails mucking with secret commands—Chrome struggles to process 3D content at the same clip as FF4 and IE9. (See our comparative benchmark chart on page 48).

POWER-USER TIPS

- **Get a geeky breakdown of Chrome's resource management by typing "about:memory" into the Omnibar, which even shows how much memory other open browsers are using.**

- **To make a favicon-only bookmarks bar, simply delete the text in the Name field when saving a bookmark. If you do this, Chrome will just show the favicon, and you'll earn 200 geek-cred points.**

- **Turn on GPU acceleration by typing "about:flags" in the Omnibar. Enable GPU Accelerated Computing and GPU Accelerated Canvas 2D.**

OPERA 11

The Opera browser finally sings with add-ons

One of the great innovators in the browser space, Norwegian software maker Opera Software has been in the browser business for 14 years, either inventing or popularizing forward-thinking concepts that we take for granted today, like tabbed browsing. This time around, Opera 11, which we're reviewing in final form, plays catch-up to the other browsers in this roundup.

WHAT'S NEW?

Given Opera Software's long history of blazing a trail in browser development, it's a bit ironic that Opera is one of the last browsers to adopt extensions, which are finally included here in the latest build. At the time of this writing, there were just 473 add-ons to choose from, though that's 473 more than were available for Opera 10. We also find it interesting that Opera is just now getting around to adding predictive text queries, known as search suggestions. Opera 11 also introduces tab stacking, allowing you to plop tabs on top of each other in manageable groups, as well as visual mouse gestures—a handy cheat sheet appears when you hold the right mouse button.

SECURITY

Opera 11 makes intelligent use of the address field to give users a quick rundown of a website's security. When visiting a site, most of the URL is grayed out or hidden, save for the main domain. In addition, security badges are color-coded, with yellow for secure, green for trusted, blue for Opera's Turbo mode, and gray for the rest. Clicking these badges reveals a site's encryption level and whether or not it has a clean security record.

PRIVACY

The option to open a private browsing session is buried deeper than in the other browsers here (Menu > Tabs and Windows > New Private

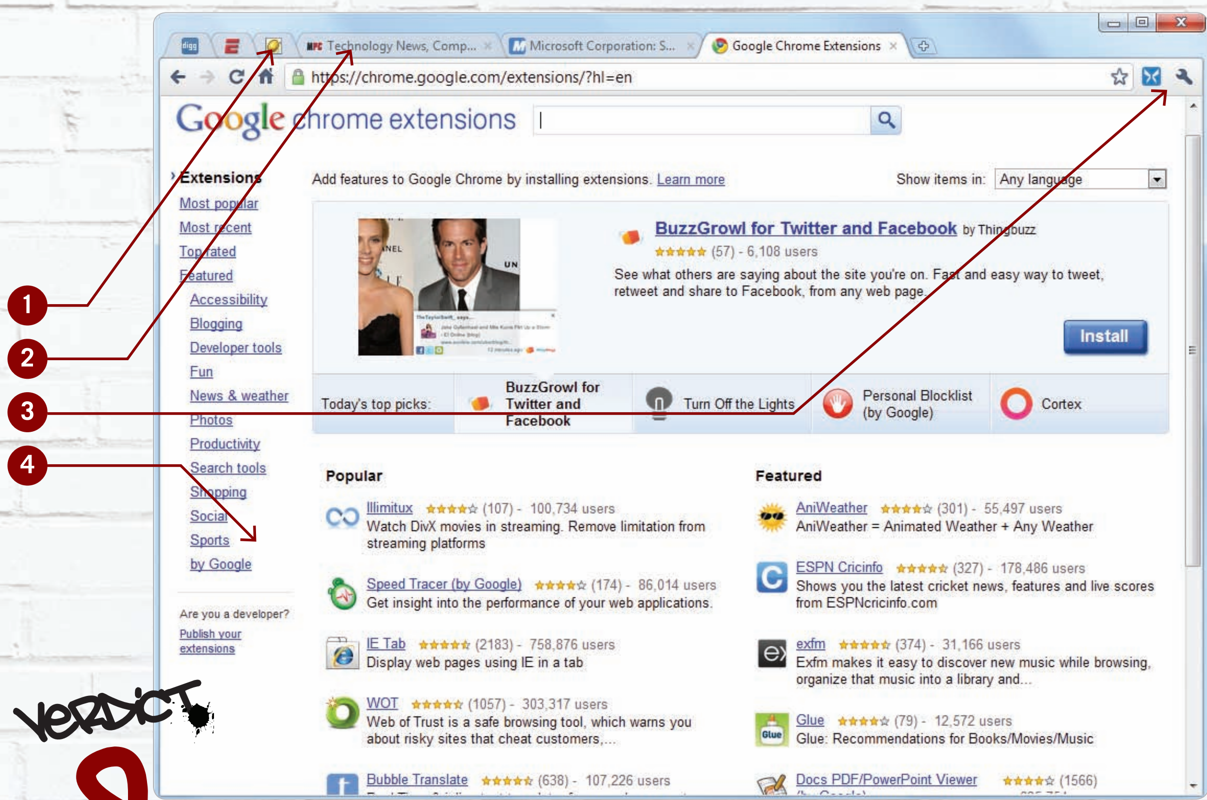
CHROME 10: FOUR KEY FEATURES

1 Power surfers often clutter their browser with oodles of tabs. In Chrome, you can right-click tabs and select Pin tab to squish it into a favicon-only representation.

2 Each tab runs in its own separate process. The great thing about this is that when a website crashes, only that tab is affected, not the entire browser.

3 We didn't think it possible to further trim Chrome's already-minimal interface, but we were wrong. Instead of a mere two icons to the right of the Omnibar, Chrome 10 has just one.

4 It's hard to believe Chrome used to lag behind in add-on development. That isn't the case today; there are now more than 10,000 add-ons to choose from.



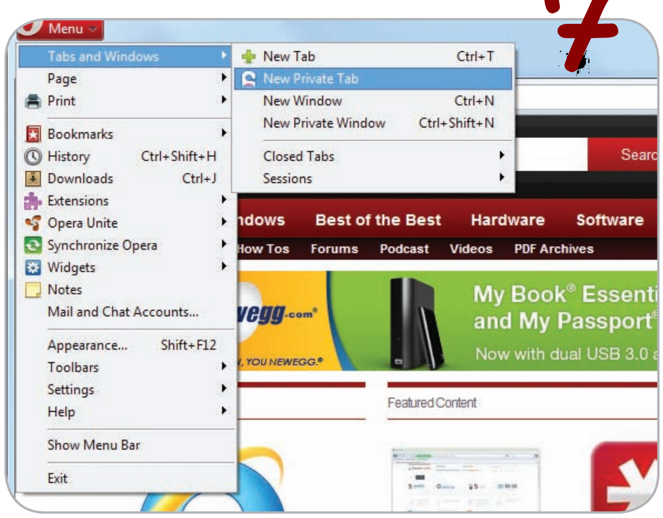
VERDICT 8

Window), but once you find it, you'll also see an option to open a private tab. And when installing extensions, two privacy checkboxes let you choose whether or not to allow them to interact with secure pages and/or private tabs.

PERFORMANCE

Hardware acceleration isn't being introduced until version 11.5, so already Opera's a bit behind the performance curve compared to some of the competition. But what version 11 lacks in GPU-assisted rendering, it makes up for in JavaScript performance and overall pep. Subjectively, browsing just feels fast, and objectively Opera 11's benchmark scores were competitive. Sadly, performance in some cases comes at the cost of compatibility, such as the inability to use Google's Instant Search for search queries or Instant Scrolling for images.

VERDICT 7



In Opera 11, you can open a private browsing session in either a new window or a separate tab.

MOZILLA FIREFOX 4

Still the best option for power users

Firefox is an open-source alternative to Microsoft's proprietary browser, and like Russell Crowe in *Gladiator*, Firefox has been winning the crowd ever since it stepped into the ring. Mozilla had just released its first Release Candidate of Firefox 4 when we put this story together, so that's what we used for testing. The final version will be out by the time you read this.

WHAT'S NEW?

Mozilla completely overhauled the user interface in Firefox 4 with the intention of making it sleeker and easier to use. It's the biggest aesthetic update since Firefox first came out, and a welcome one if you appreciate less clutter. All the menu items are neatly tucked away and accessible via a single Firefox button in the upper-left corner.

New features abound, like the ability to sync your browser settings across multiple devices, multitouch support in Windows 7, and a new tabbed interface drawing inevitable comparisons to Chrome. The Add-On Manager now opens in a tab, too.

SECURITY

As you might expect, Firefox 4 is the most secure version of Firefox yet. It's also the least glamorous topic because many of the safeguards that keep the bad guys away work silently in the background. One of the biggest new security safeguards is a new feature called HTTP Strict Transport Security. This is supposed to prevent man-in-the-middle attacks that hijack regular HTTP connections and make them appear as HTTPS, like when logging into a banking institution while using an untrustworthy network (think of a public Wi-Fi hotspot). Support in Firefox is only half of the equation; HSTS also requires websites to play ball.

PRIVACY

Firefox's Private Browsing mode is left largely unchanged in Firefox 4, which means you can't run an incognito session and a regular session simultaneously like you can in Chrome, even if you have multiple browser windows open. Firefox does, however, restore your regular session when you're finished, um, looking up anniversary gifts (that is why you use Private Browsing, right?).

There's also a new Do Not Track feature receiving tons of hype. When enabled (found under Options > Advanced), Firefox sends a header to websites telling them you don't want to be followed. It's a neat idea, but still relies on the honor system; a website can choose to blatantly ignore your request.

PERFORMANCE

Midway through Firefox 4's development, Mozilla injected the browser with its JägerMonkey JavaScript engine, a wise move considering that earlier betas of the next-generation browser felt sluggish and were getting slammed in the enthusiast community. In its current form, Firefox 4 runs and feels much faster than its predecessor, though it still isn't as nimble as Chrome in JavaScript-heavy tasks. But unlike Chrome, Firefox boasts hardware acceleration, tapping into your GPU to boost performance when rendering graphics-heavy tasks. Chrome will address this in version 11, but for the time being, the advantage belongs to Firefox (and IE9).

POWER-USER TIPS

- **To quickly view pages you've recently visited, right-click the left and/or right arrow(s).**

- **Is your favorite Firefox 3.6 add-on blocked in FF4? Type "about:config" in the address bar. Right-click and select New > Boolean, and enter "extensions.checkCompatibility.4.0". Select False for the value.**

- **Miss the menu bar? Bring it back by pressing Alt > View > Toolbars > Menu Bar.**

SAFARI 5

One of the fastest browsers around (in 2010)

It's easy to tell that Apple developed the Safari browser, which looks like it was plucked straight from Mac OS X. That's because it was. Safari started off as a Mac-only browser in 2003 before making the jump to Windows in 2007. Safari 5, the last major update, came out in June 2010.

WHAT'S NEW?

If you abhor flipping through multipage articles, you'll instantly fall in love with Safari Reader. This handy tool automatically detects when you're on an article page and presents a Reader icon in the address bar. Clicking it brings up the entire article in a scrollable eBook-like reader in the foreground stripped of extra elements, like ads and buttons. It's an awesome way to digest longer write-ups.

Safari 5 supports extensions, which are divided into 16 categories. There's also a hidden extension builder accessible by enabling the Develop menu in the menu bar (Settings > Preferences > Advanced) if you want to try your hand at making your own add-ons.

SECURITY

On the Mac OS X platform, Safari tags downloads with certain vitals, like when a file was downloaded and where it came from. That same information isn't available in Windows, though Safari's other safeguards extend across both platforms. Safari blocks tracking cookies by default, as well as pop-up ads, and it also includes a cross-site scripting (XSS) auditor that sniffs out and filters malicious scripts.

PRIVACY

Steve Jobs once famously said, "Folks who want porn can buy an Android phone," but it turns out they can also use Safari, which includes a private browsing mode like all the other browsers in this roundup. And like the others, Apple pitches less obscene uses for private browsing, like checking your email at a

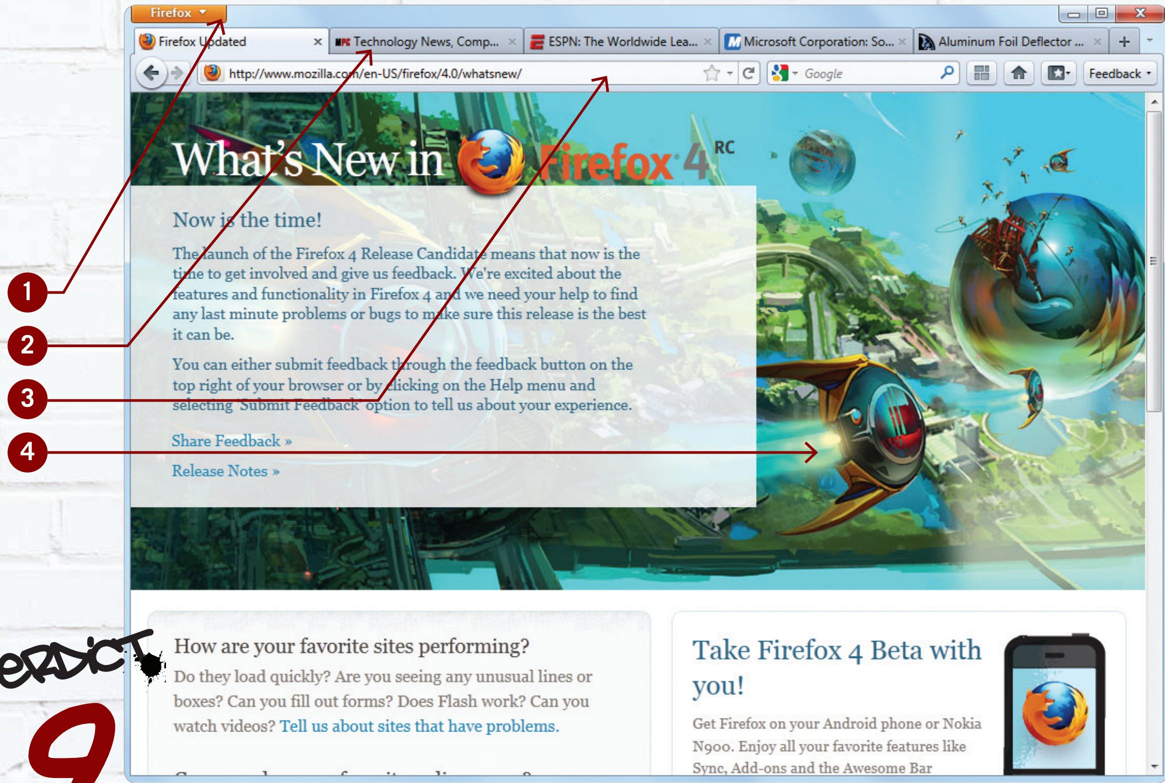
FIREFOX 4: FOUR KEY FEATURES

1 Mozilla made a concerted effort to reduce clutter by removing most of the menu items. These are now accessible via the new Firefox button in the upper-left corner.

2 Tabs on top? Either the world's gone topsy-turvy or Mozilla took a cue from Chrome when streamlining the interface. Mozilla had its own reasons for moving the tabs, which are explained at bit.ly/cmdTVP.

3 You can now navigate tabs using Firefox 4's Awesome Bar. If "Switch to Tab" appears as you're typing in the Awesome Bar, select it to bring up the corresponding tab.

4 Firefox 4 includes the new, speedy JägerMonkey just-in-time (JIT) JavaScript compiler and the Gecko 2.0 layout engine, each with plenty of new HTML5 tricks up their sleeves. Mozilla also added GPU acceleration.



VERDICT 9

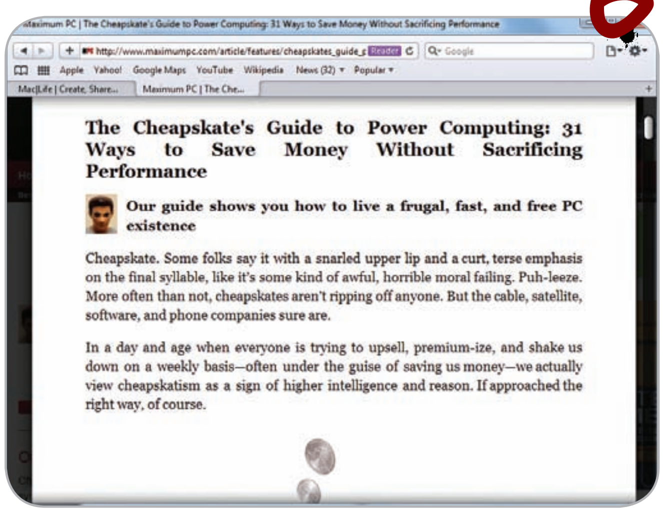
library (yeah, sure).

Safari 5 boasts built-in parental controls for parents of kids who aren't computer savvy enough to figure out how to circumvent them, but this is another option native to Mac OS X and not available in Windows. If you do own a Mac, you can set up a list of approved websites and view activity logs, all within the browser.

PERFORMANCE

Six months ago we'd be singing a different tune, but compared to the current crop of browsers, Safari 5 is a step behind. The Nitro JavaScript engine is in need of another tune-up, and while hardware acceleration is present, it didn't pay off in benchmarks. And what's with not being able to search in the URL bar? Boo!

VERDICT 6



Both Firefox and Chrome have add-ons that remove the clutter from multipage articles and presents them in a single, scrollable box, but only Safari includes this functionality by default.

MICROSOFT INTERNET EXPLORER 9

Look who decided to show up to the modern-day browser scene!

Internet Explorer's tight integration with Windows played a big role in Microsoft's ability to bury its one-time nemesis Netscape Navigator. IE's market share skyrocketed, and then innovation came to a screeching halt. More than five years passed between the release of IE6 and IE7, and there have only been two major revisions since then.

IE9 graduated from Release Candidate to a final build just in time for us to include it here.

WHAT'S NEW?

Out of the box, IE9 affords more real estate for browsing than either Chrome or Firefox, and that's because Microsoft whittled the UI down to the bare essentials. Everything's been consolidated to a single row, with tabs appearing to the right of the dual-purpose URL/search bar.

IE9 integrates well with Windows 7, and specifically Aero Snap. To view web pages side-by-side, you simply drag two tabs to opposite ends of the screen and they'll snap in place next to each other. You can also pin sites to the Taskbar simply by dragging them there.

There's a new Download Manager (finally!) that lets you pause downloads, an Add-on Performance Advisor that audits add-ons and tells you how much they're bogging down your browser, and if you right-click anywhere in the main window, you can navigate directly to an address copied to your clipboard.

SECURITY

One of the biggest concerns with Internet Explorer has always been Microsoft's ActiveX technology, which hackers like to use as a gateway to install malicious software on your PC. Microsoft introduced Per-Site ActiveX controls in IE8, prompting users when a site tries to run ActiveX. Microsoft has taken it a step further in IE9 with ActiveX Filtering, which allows users to turn off ActiveX controls for the entire web and enable them only for trusted sites. IE9 includes an improved Smart Screen filter that checks websites for malicious code, and the Download Manager performs several security checks before downloading files. There's also a cross-site scripting (XSS) filter that helps prevent compromised websites from recording your login information.

PRIVACY

By now you're undoubtedly familiar with IE's InPrivate Browsing mode, or porn mode. The feature remains in IE9.

Private browsing was last year's big-ticket item. This year it's tracking protection. IE9 offers surfers a new opt-in mechanism that blocks elements of websites from tracking your online behavior. This is accomplished by subscribing to Tracking Protection Lists (TPLs), which you have to seek out on your own and enable. It's sort of like a cross between a Do Not Call list and a lite version of Adblock, in that some ads end up being blocked, depending on which list(s) you subscribe to.

PERFORMANCE

Despite the drastic new look to IE9, the biggest changes are all behind the scenes. Microsoft rewrote the layout engine from the ground up for rich, interactive sites, and the new Chakra JavaScript engine is several times faster than in previous versions of IE. Hardware-accelerated graphics also play a big role in IE9, which is revealed in several tech demos on IE9's website.

Is IE9 fast? The answer is yes, and this is the first version of IE that doesn't feel as though it's being dragged down by unnecessary cruft. And while it's still not as snappy as Chrome, IE9 has the edge in processing GPU-accelerated content, at least temporarily.

POWER-USER TIPS

- **To always open IE9 in full-screen mode, open up your system registry (Start > Regedit) and navigate to HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\Main. Change the Fullscreen value to Yes.**

- **To run InPrivate Mode automatically, create a desktop shortcut and type the following in the path box: "C:\Program Files\Internet Explorer\iexplore.exe" –private**

- **Don't like the placement of the Stop and Refresh buttons? Right-click and select "Show Stop and Refresh before Address bar."**

BROWSER PERFORMANCE COMPARED

	Chrome 10	Firefox 4	Internet Explorer 9	Safari 5	Opera 11
Futuremark Peacekeeper	**10,963**	5,143	7,230	5,563	**10,966**
SunSpider (ms)	231.2	226	**195.1**	303.1	227.9
Google V8	**9,743**	4,693	3,006	2,995	4,362
Celtic Kane JSBenchmark	**856**	610	499	518	635
NonTroppo Table Rendering (ms)	227	538	777	**136**	304
GUIMark HTML5 (fps)	7.4	21.6	20.1	5.5	**34.6**
Mozilla Dromaeo JavaScript (runs per second)	**715.5**	491	591.3	290.4	470.5
Acid3	100	97	95	100	100
Microsoft Preschool Demo (sec)	15.5	13.2	**3.9**	WNR	WNR
Microsoft Maze Solver Demo (sec)	189	104	14	118	**8.8**
Microsoft Psychedelic Demo (rpm)	74	3,016*	**10,120**	38	46*

*Best scores are bolded. Our test bed was a Intel Core i7 930, Asus P6X58D Premium, 6GB Corsair DDR3/1333 RAM, a Radeon HD 5850, a Kingston 64GB SSDNow, and Windows 7 Professional 64-bit. *Did not play sound.*

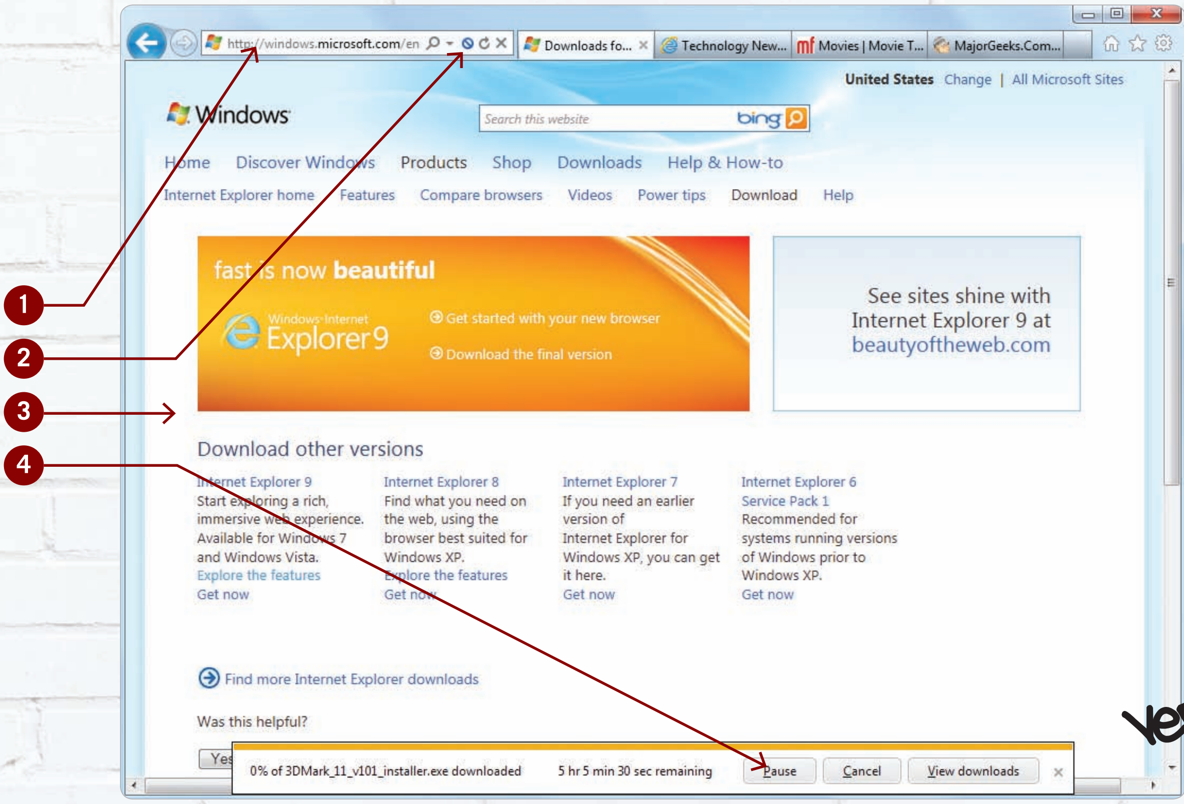
INTERNET EXPLORER 9 : FOUR KEY FEATURES

1 IE9 is more than a polished upgrade; it's an entirely new vehicle for navigating the web. Gone are all the clunky controls, replaced by a sleek UI that affords more space for the main browser window.

2 You don't have to mess around with ActiveX requests in IE9 if you don't want to. Just turn them off altogether by enabling ActiveX Filtering.

3 Since when is IE fast? Since IE9, that's when. Microsoft built brand-new JavaScript and rendering engines for IE9, and then injected GPU acceleration to offload text, video, and graphics to your videocard.

4 At long last, Microsoft integrated a useful and intelligent Download Manager capable of pausing, restarting, and locating downloads. Why wasn't this ever included before?





AND THE BETTER BROWSER IS...

If we've learned anything here, it's that the browser market is in great shape. Firefox still gets our nod as the best of the best, but it's not a runaway victory. If Chrome came with hardware acceleration enabled by default—and it will in version 11—then we might have given the nod to Google. Chrome 10 is fast, it's polished, and its extensions library is fleshed out. But so is Firefox 4, which has the added benefit of tapping into your GPU without the need to muck around with advanced code.

While enthusiasts debate the merits of Chrome versus Firefox, the biggest surprise is Internet Explorer 9. For the first time in a long time, a case can also be made for IE as the best browser of the bunch. We're not willing to go that far, but there's no doubt IE9 is a potential game changer for Microsoft, and not a moment too soon. IE's market share lead continues to shrink as users seek out faster, sleeker browsers, and IE9 is both of those, plus a whole lot more. If IE9 represents the direction Microsoft is headed, Chrome and Firefox could be in trouble.

Alternative browser users don't have it quite as good. Safari is a generation behind, and while we're fans of Opera, the latest release is more about catching up to the competition than blazing a new trail, as has been Opera's M.O. Still, it's another solid option among many.

WHITE PAPER

Quantum Computing

In the future, we'll ditch binary bits for decidedly nonbinary qubits. The end result will revolutionize computing –BILL O'BRIEN

Despite the misconception created by phrases such as "quantum leap," quanta are among the smallest known particles in the universe. If they weren't, quantum computing wouldn't be such a big deal.

At its core, quantum computing leverages the possible dimensions associated with the quantum properties of a physical atom. The construction of a quantum computer involves the arrangement of entangled atoms. A quantum entanglement is a description of the state of a system containing two or more objects. The objects within such a system are associated in such a way that the quantum state of any one of them cannot be adequately described without full mention of the others—even if the objects are separated from each other.

If that's starting to sound a bit complex, you're probably an Einstein devotee. He and a few friends (Podolsky and Rosen, to name two), postulated that all physical objects have real values at all times. Unfortunately, thanks to the behavior of particles on the atomic level, that's not necessarily the case for quantum computing.

PARTS IS PARTS

The core of a quantum computer starts with a quantum bit, or qubit as it's more often called. The qubit is the fundamental equivalent of the digital computing "bit." However, while a bit *must* be either 1 or 0, a qubit *can* be either |0> or |1> (for the purposes of quantum computing, the added notation indicates that the object can be a state, a vector, or a ket).

To visualize the possible states of a single qubit we typically use a Bloch sphere. Within such a sphere, because of its on/off nature, a classical bit could only be at the "north pole" or the "south pole," in the locations where |0> and |1> are positioned, respectively. The rest of the surface of the sphere is inaccessible to a classical bit but not in the case of a qubit. A qubit state can be represented by any point on the surface—*any point*. For example the pure qubit state

$$\frac{|0\rangle + i|1\rangle}{\sqrt{2}}$$

would lie on the equator of the sphere, on the positive y axis.

COMPUTING ON THE QUANTUM LEVEL

A quantum computation is performed by initializing this system of qubits with a quantum algorithm. "Initialization" here refers to some process that puts the system into an entangled state.

How to do that? In a natural state, subatomic particles decay into other particles. The decay follows the atomic laws of conservation and you can, therefore, generate pairs of particles that will be in certain predictable quantum states.

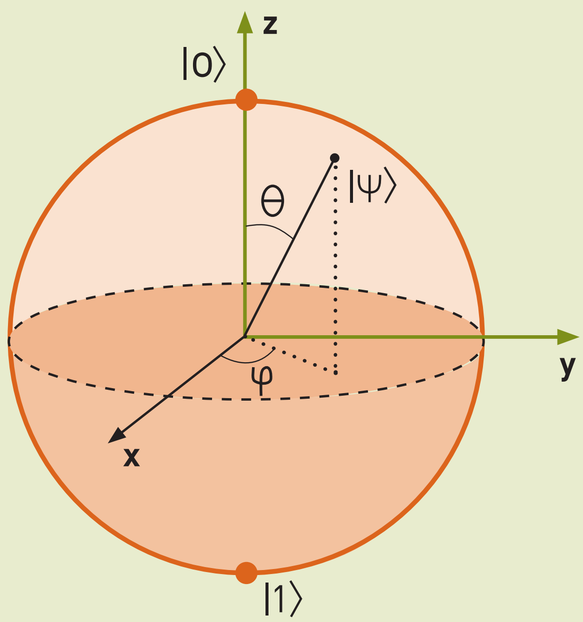
Purposefully initializing such a system typically entails one of the following methods: using spontaneous parametric down-conversion, where a nonlinear crystal is used to split incoming photons into pairs of photons of lower energy; using a fiber coupler to confine and mix photons; or using a quantum dot, a semiconductor whose excitons are bound within all three spatial dimensions, giving it properties that are somewhere between those of bulk semiconductors and those of discrete molecules, to trap electrons until decay occurs.

Typical computational gates use Boolean logic, but in quantum computing, these gates are represented by matrices, and can be thought of as rotations of the quantum state within a Bloch sphere (see the infographic below).

Manipulating these states presents the probability of performing a mathematical operation on all of a qubit's states simultaneously. For example, as a single qubit state can be 1 and 0 or 0 and 1, we could compute four values at once using two qubits. Doubling that to four qubits pushes the possibility to 16 values, and

HOW IT WORKS

The Bloch Sphere



This Bloch sphere is the typical representation of a qubit and indicates its possible states. A typical bit would have states on the north and south poles of the sphere. A qubit's state can be represented by any point on the surface.

so on. The more you increase the number of qubits, the more the processing power increases in an exponential fashion. It's akin to the way we started back in the dark ages with 4-bit, then 8-bit, then 16-bit processors until now we've reached 64-bit (on the desktop at least). Here as there, increasing the number of bits increases the data precision as well as the amount of data the CPU can handle in one fell swoop.

IS QUANTUM COMPUTING PRACTICAL?

While the first quantum processor was built back in 2009 by a team out of Yale University, a useful quantum computer is still at least that ubiquitous 10 years (if not further out to 50 years) away. Early quantum algorithms tried to exploit very simple quantum computing, using what's called "oracles." Like a Magic 8-Ball, they were designed to deliver yes or no answers. That's hardly adequate for even our most basic binary computer of today.

Beefing up a quantum computer is not simple. The overall goal is to stay small, but just the logic gates alone are a serious point of consideration. A 16-qubit computer can register a single "NOT" gate. Now imagine the possibilities beyond that.

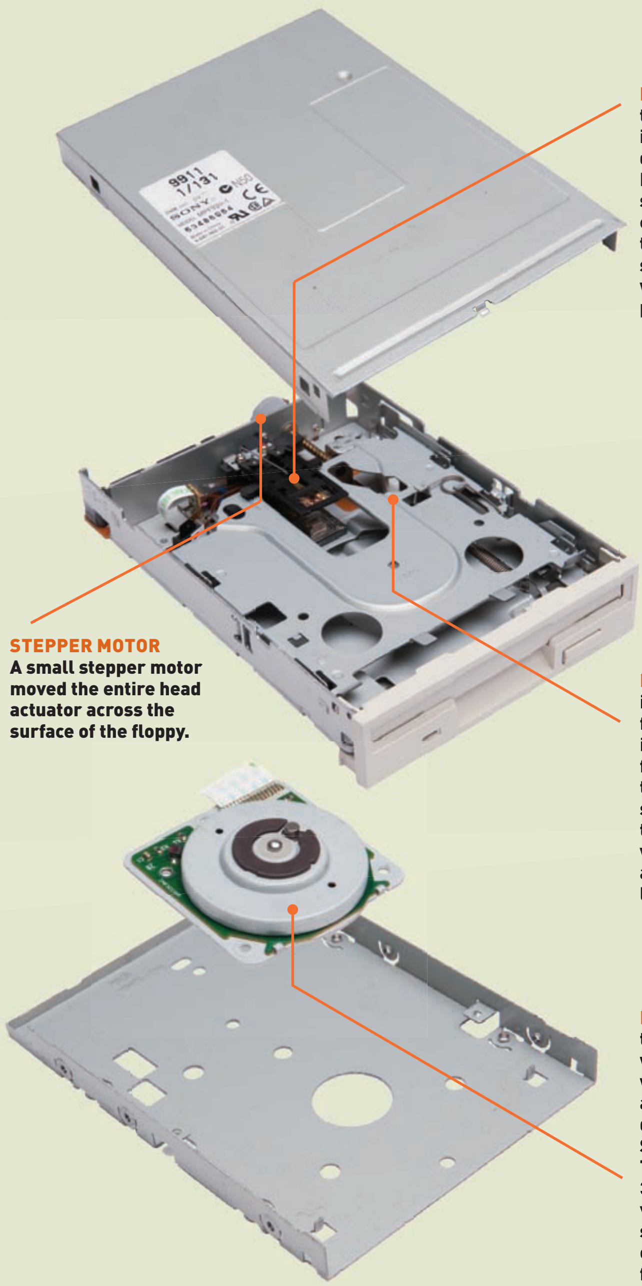
We might be able to cure some of the clutter if we use ternary computing lessons (three possible values as opposed to transferring binary technology, which uses bits) that employ "trits" to store data. With this method, it may be possible to transfer this concept over to quantum computing with a roughly equivalent qutrit. That alone would reduce the number of gates significantly, possibly lowering a 50-gate construct down to one needing only nine gates.

Coherence is another hurdle. Simply looking at a qubit (or in any other way letting it interact with the environment) will cause it to decohere or dephase. Decoherence impedes superimposition, which reduces the quantum computer's effectiveness—sometimes down to binary levels.

Still, however, once these impediments have been conquered, over whatever time period it might take, a quantum computer could tackle password and encryption problems, as well as simulations and design tasks, in a matter of heartbeats, where a conventional binary computer might require a lifetime. That's what makes them so magical. ⏻

Sony Floppy Drive

Sony, the sole manufacturer of floppy disks today, has said it will cease production of the devices early next year. That will close the book on the floppy disk, particularly the 3.5-inch model, some 28 years after it was introduced. To celebrate the passing of the floppy, we decided to look inside one of Sony's drives to see what makes it tick.



SUBMIT YOUR IDEA Ever wonder what the inside of a power supply looks like? Don't take a chance on destroying your own rig; instead, let us do the dirty work. Tell us what we should crack open for a future autopsy by writing to comments@maximumpc.com.

HOW TO

Step-by-Step Guides to Improving Your PC

THIS MONTH

WHY KINECT IS EXCITING



ALEX CASTLE
ONLINE MANAGING EDITOR

In this month's How To we've got our first real look at how to use Microsoft's Kinect Xbox controller with a PC. And while there are lots of videos showing fun things people have made with Kinect and the middleware that's out there right now, I'm still mostly excited by the device's potential. Here are a few things I want to see from Kinect:

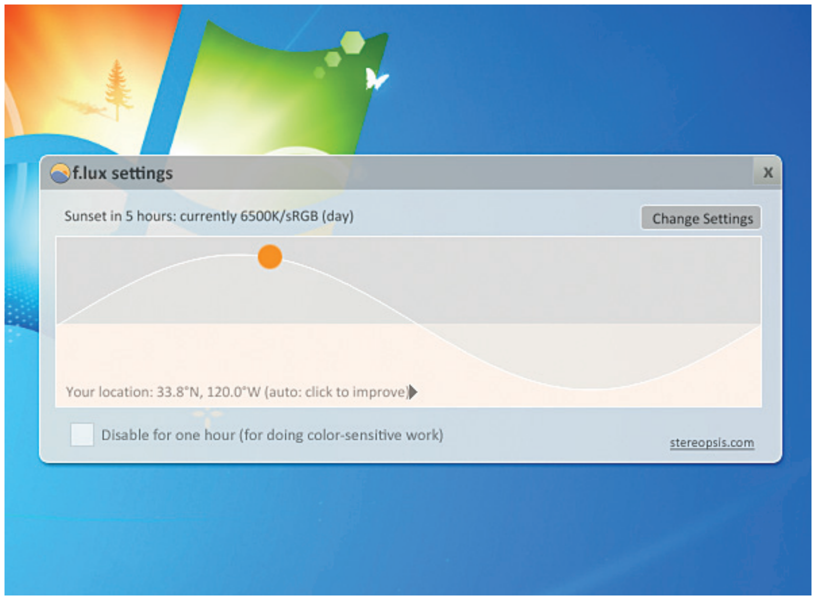
1. Affordable 3D scanning and motion capture. Already sort of here, in the form of Brekel Kinect, but there's a lot of room for improvement in fidelity.

2. Immersive virtual reality. Imagine exploring a virtual world à la Second Life with an avatar that actually does what you do, and moves like you move. It's like the Matrix, but less evil.

3. Gesture support in Windows. Come on, how long has it been since *Minority Report* already? I don't care if it's impractical, I want it.

SUBMIT YOUR IDEA Have a great idea for a How To project? Tell us about it by writing to comments@maximumpc.com.

WINDOWS TIP OF THE MONTH



Use F.lux to Keep Your Monitor Looking Great

Different ambient lighting conditions call for a different color balance on your monitor—a screen that looks great during the day will be blindingly bright at night. It's too much of a pain to manually change the balance throughout the day, so use F.lux (bit.ly/yJqUZ) to do it for you.

Hack Your Kinect

When the Kinect first launched last November, gamers were (to put it charitably) a bit skeptical. Here was a device with incredible technological potential, and the most impressive game that came out with it was a *dance simulator*.

Still, the Kinect has become a bona fide hit, selling more than eight million units in the first 60 days alone and being named the "fastest-selling consumer electronics device" of all time by *Guinness World Records*. But more importantly, the software problem has been solved. Not by Microsoft, whose Kinect releases have been few and far between, but by the ever-growing legion of hackers creating innovative tech demos and applications for Kinect on the PC.

If you have a Kinect, you owe it to yourself to see what's happening in the hacking scene—putting this knowledge to use isn't even that hard. Follow along and we'll show you how. –ALEX CASTLE

1 SET UP YOUR KINECT

Physically setting up the Kinect is a piece of cake, as long as you have the stand-alone power supply that comes with the boxed version of the Kinect. If you do, just plug in the power supply, connect it to the Kinect, and then run the USB cable over to the PC (don't plug it in just yet, though).

Unfortunately, if you bought the bundle that includes an Xbox 360 S and the Kinect together, that doesn't come with a power supply. If you want to use your Kinect with a PC you'll have to order a stand-alone power supply (image A) from Microsoft at bit.ly/heLdOQ.

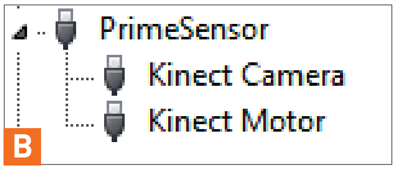


A

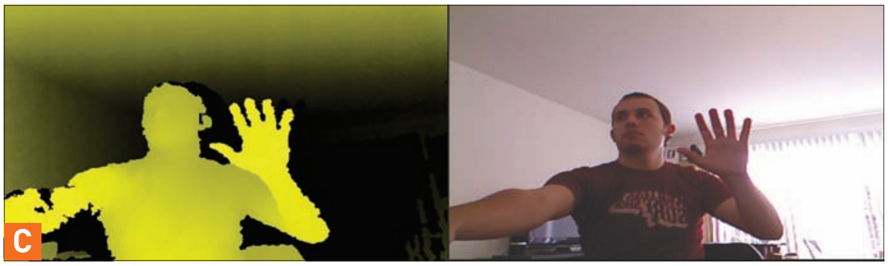
2 INSTALL PRIMESENSE OPENNI AND SENSOR KINECT

With the Kinect physically ready to go the plan gets a bit more complicated. You're going to need to install a total of three things on your system before you can start running software for the Kinect on your PC—one driver, and two pieces of middleware.

Normally, in a situation like this we would want to start with the lowest-level



B



C

piece of software, the driver. However, in this case, the driver (Sensor Kinect) won't install without the first piece of middleware (OpenNI), so we'll start there.

But first, why do we need middleware? Early Kinect hacks relied entirely on rough-around-the-edges drivers that could extract the raw images and depth maps captured by the Kinect sensor. People were able to make some cool hacks using those data streams, but you had to be familiar with image-processing programming in order to do much of anything. OpenNI, from PrimeSense (the Israeli Company that Microsoft licensed the Kinect Technology from in the first place), is middleware that allows developers easier, more abstracted access to sensor data, without having to do the low-level stuff themselves. It's hardware-agnostic, so OpenNI software will work with any sensor device that has an OpenNI driver written for it. As it stands, Kinect is the only such sensor.

To install OpenNI, just go to the download page at bit.ly/fyjLFy and scroll down until you see the link to download the latest unstable build for Windows. Download and run the installer—there shouldn't be any surprises here.

With OpenNI installed, you can now use the Sensor Kinect driver. Go to the Sensor Kinect GitHub page at bit.ly/gqWMY9 and click the Downloads button, then click the Download .zip button under Download Source. You won't have to actually compile any source code, though—just extract the contents of the .zip file and navigate to the Bin/ directory, which contains a binary Windows installer. Run through the quick installer and you'll be good to go.

At this point, you can plug your Kinect into the computer and perform some quick tests to make sure everything's on track. First, when you plug in the Kinect, your computer should recognize it for what it is. If you go to the Device Manager, you'll see a PrimeSensor category that includes a Kinect Motor and Kinect Camera device (image B).

OpenNI needs to be configured to run properly, which is handled with a set of XML files in the OpenNI/Data directory. Fortunately, the Sensor Kinect .zip file contains some preconfigured files for you to use. Go back to the directory you extracted the Sensor Kinect source code to, and find the OpenNI folder. Copy the contents of this folder to the Program Files\OpenNI\Data folder.

Finally, open the .xml file you just copied over, because we have to make one more change. In the beginning, there's a section that reads

```
<Licenses>
<!-- Add licenses here
<License vendor="vendor" key="key"/>
-->
</Licenses>
```

Change this section so that it reads like this:

```
<Licenses>
<License vendor="PrimeSense" key="0KOIk
2JeIBYClPWVnMoRKn5cdY4="/>
</Licenses>
```

Don't worry, it isn't piracy—this license key is provided by PrimeSense to the community.

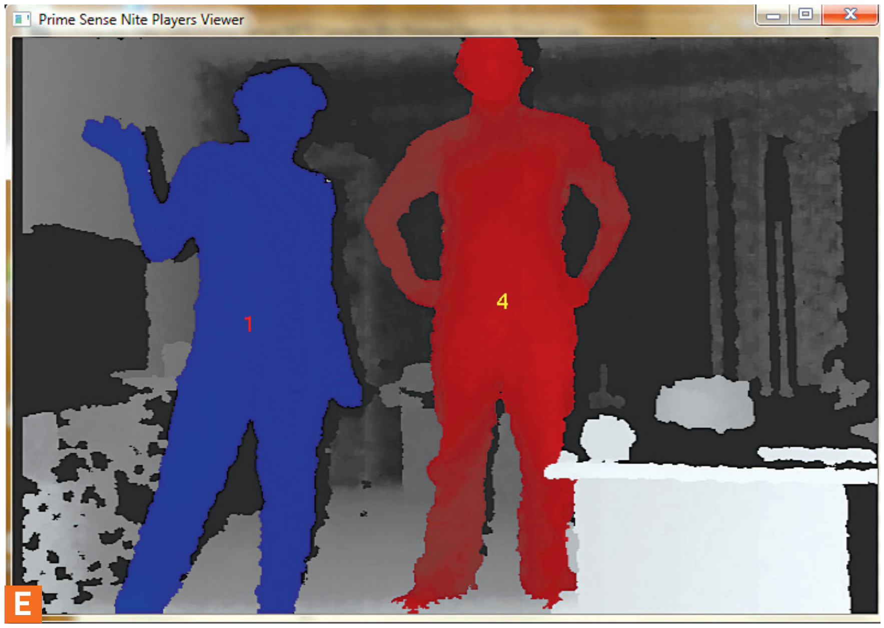
Finally, we can run a software test to make sure everything's working. Go to

the folder you installed OpenNI to, then navigate to Samples\Bin\Release and find the file niviewer.exe. When you run this program, you should see a video stream side-by-side with a single-color depth map (image C). If you do, you're more than halfway done.

3 INSTALL NITE

NITE is another component of the overall PrimeSense package. It's the higher-level middleware, which interprets the raw sensor data and translates it into more useful constructs—isolating gestures and identifying where your body is. These tools are used by many of the developers creating software for Kinect today.

You can download the latest version of NITE at bit.ly/fsfFEg. The installation is pretty much the same as with OpenNI, except that partway through, you'll be asked for a license key. Again, use "0KOIk2JeIBYClPWVn-MoRKn5cdY4=".



E


```
Sample-User.xml - Notepad
File Edit Format View Help
<OpenNI>
	<Licenses>
		<License vendor="PrimeSense" key="0KOIk2JeIBYClPWVnMoRKn5cdY4="/>
	</Licenses>
	<Log writeToConsole="true" writeToFile="false">
		<!-- 0 - Verbose, 1 - Info, 2 - Warning, 3 - Error (default) -->
		<LogLevel value="3"/>
		<Masks>
			<Mask name="ALL" on="false"/>
		</Masks>
		<Dumps>
		</Dumps>
	</Log>
	<ProductionNodes>
		<Node type="Depth">
			<Configuration>
				<MapOutputMode xRes="640" yRes="480" FPS="30"/>
				<Mirror on="true"/>
			</Configuration>
		</Node>
		<Node type="User" />
	</ProductionNodes>
NI>
```
D

Once you've installed NITE, you'll have to run through basically the same configuration process as with OpenNI. Go to the Sensor Kinect source directory, find the directory labeled NITE, and copy its contents into the Program Files\Prime Sense\NITE\Data directory. Open each XML file in Notepad, and insert the license key where needed (image D).

You can find NITE sample programs in the NITE\Samples\Bin\Release directory. A good one to start with is Sample-Players.exe, which simply shows you a video feed of what the camera sees, with each human it sees shaded in a different color (image E).

4 INSTALL SOFTWARE

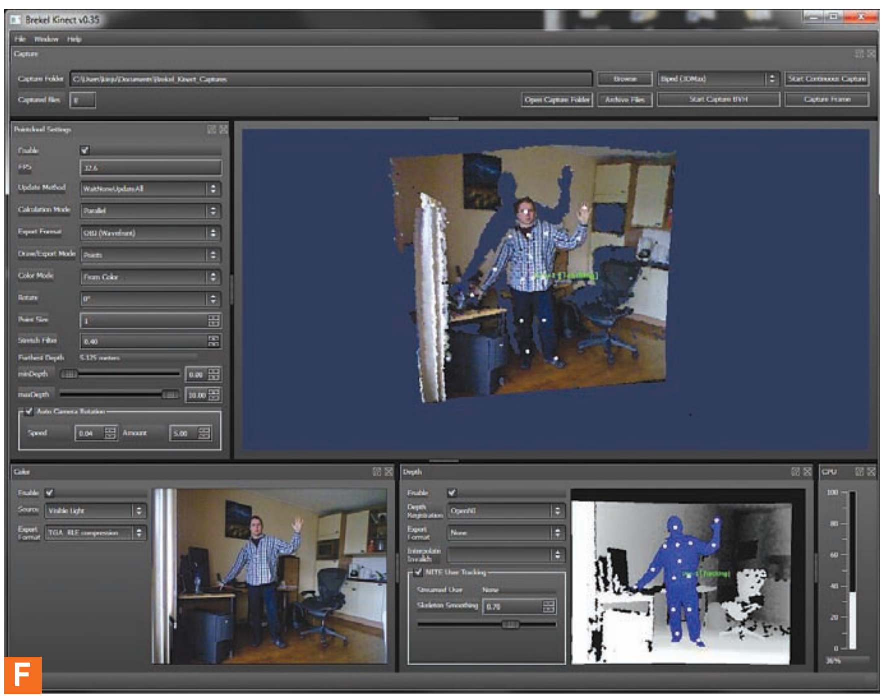
Congratulations! You've hacked your Kinect! Enjoy those Kinect sample applications that came with NITE.

What, you want more? Well, alright. Here are a few programs you can try to get yourself started:

FAAST Short for Flexible Action and Articulated Skeleton Toolkit, FAAST lets you control the mouse and keyboard with Kinect. Prepare to live out all your *Minority Report* fantasies. bit.ly/exTk6O

Brekel Kinect This package turns the Kinect into a makeshift motion-capture device/3D scanner. It can capture and export skeletal animation or 3D meshes for use in your 3D modeling program of choice (image F). bit.ly/eXfiJJ

Zombie Holdout And just because no list would be complete without a game, here's Zombie Holdout. Resident Evil it ain't, but it's still fun to play a non-Xbox game on Kinect. bit.ly/fRagRi



F

Instantly Search for Files with 'Everything'

With Vista and Windows 7, Microsoft has been making some big strides in the quality of Windows's native search. For regular, targeted searches (finding a file in your downloads folder, for instance), it does a great job of giving you near-real-time results. Unfortunately, that's not always good enough.

Sometimes you know you've got a file, but you just can't remember where you put it. That means you've got to resort to the dreaded Search Local Disk (C:), or even worse, Search Computer. It doesn't take as long as it used to, but it can still take quite a while to find what you're looking for. If you find yourself in this situation regularly, you need true instant search. You need Everything. –ALEX CASTLE

1 INSTALL EVERYTHING

No, you don't have to install everything on the whole Internet—just one program, which is confusingly named Everything. Everything is an indexed search app, which quickly creates an index of every file on your computer, and then allows you to search through all of them by name, instantly.

You can download Everything from the Void Tools homepage at www.voidtools.com. Just pick up the Windows installer executable and run it. During the installation you'll be asked which components you want to install. The default options will work for most people, but if you're the type to worry about context menu clutter, you might consider unchecking that option.

When you finish the installer, Everything will launch. You're given another chance to review the options, but for now just click OK. At first, Everything will be blank, except for a search bar up top and the words "Scanning Drive C:" below. Give Everything a moment to index all the files in your system, and in a (surprisingly) short while, you'll see a list of *every single file* on your whole PC (image G). Go ahead, take a minute to try searching for something. We'll give you some time to collect your jaw off the floor.

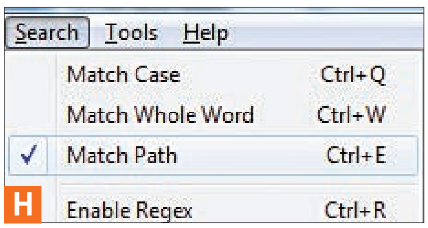
2 SEARCH

Hopefully by now you've recovered from the initial shock of completely instant search. Here are some tips for searching in Everything.

Use logical operators. The default if you type "foo bar" is to search for foo *and* bar. To search for foo *or* bar, use the pipe character (|). To search for foo and *not* bar, use the exclamation mark.

Use wildcards. You can use the asterisk or question mark character as a wildcard character.

Search in a single folder. To search for files in a folder, click Search in the navigation bar, and enable the Match Path option (image H). Now, searches will also apply to the file path, in addition to the name.

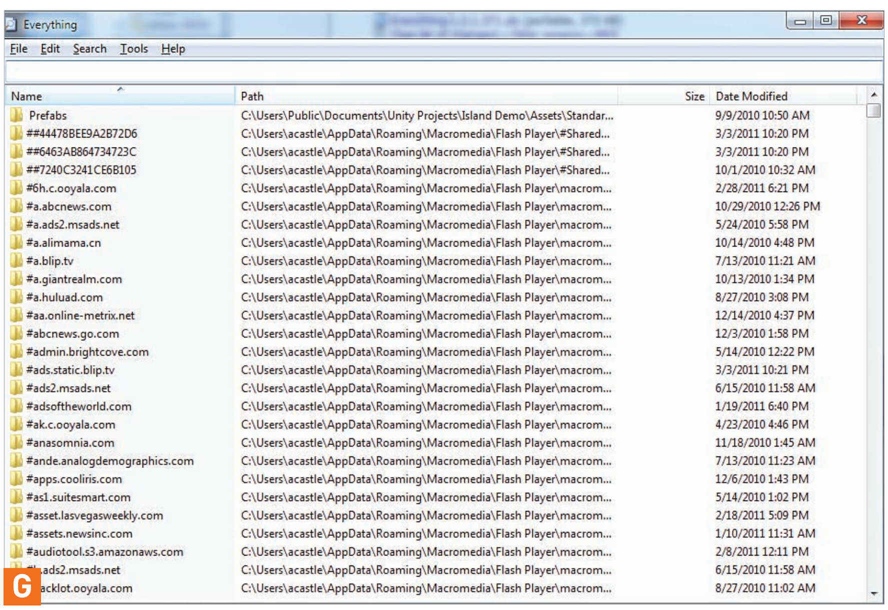


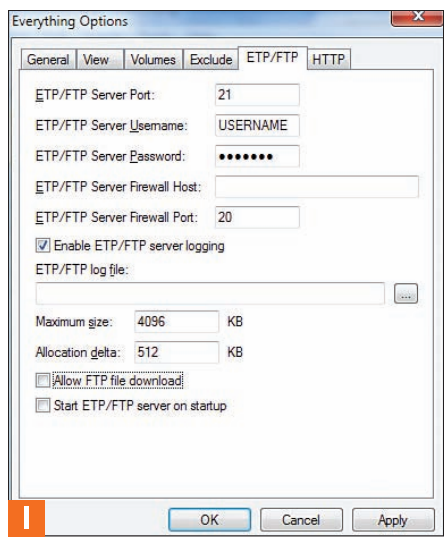
3 SEARCH REMOTELY

If you'd like to remotely search the contents of your home PC using Everything, that's also simple. Just open the options menu and browse to the ETP/FTP tab, and set a username and a password (image I). Also, note the ETP/FTP server port. If you only want to search, and not download files, you can uncheck the box that says "Allow FTP file download."

If your home computer doesn't have a static IP address, you'll have to obtain one by using a free service like DynDNS.org and telling your router to reserve a subnet IP for your computer.

Now, on the remote computer, just start up Everything and click Tools > Connect to ETP server and enter the same information as before, including your IP address. Now you should be able to use Everything just as you normally would, to search through your home computer's files. If you didn't uncheck the box, Everything will also act as an FTP server, so you can download any files you need.



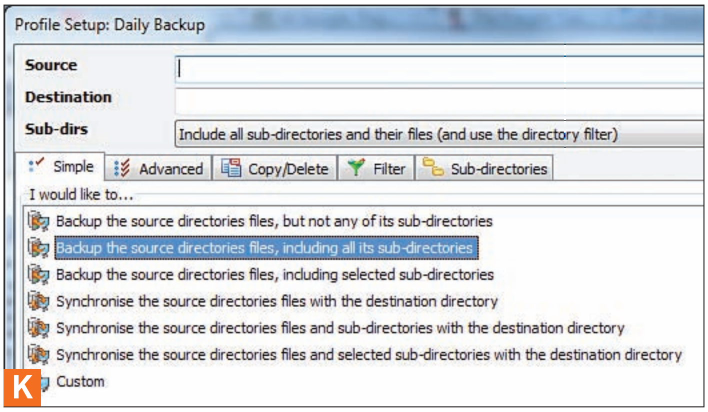


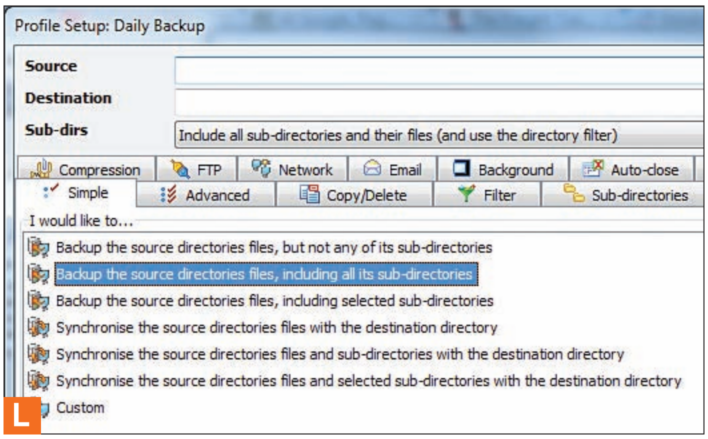
How to Back up Everything with SyncBack

We remember a time when "back up" meant hitting the "clone drive" button—and that was about as hard as it got. Unfortunately, things have changed. Now that we measure our digital lives in terabytes instead of megabytes, it's just impractical to copy the entire contents of one drive over to another as part of a routine backup schedule.

That's why we like 2Bright-Sparks' SyncBack program. With but a few clicks of a mouse you can ensure that only the files you care about most are either backed up on a regular basis or, better yet, automatically synchronized between two locations at once.

These are just a couple of the powers promised by the freeware version of SyncBack. In the following guide, we'll show you how to use this simple application to transform your normal backup procedures (or lack thereof) from time-consuming, self-starting routines into precise, automated awesomeness. —DAVID MURPHY





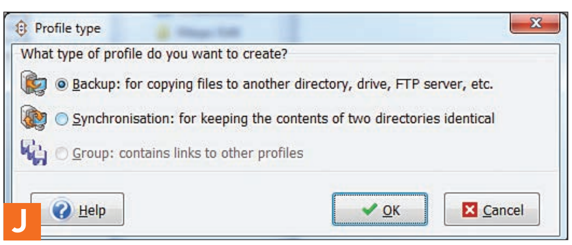
1 SET UP YOUR PROFILE

After installing the free version of SyncBack, available at www.2brightsparks.com, you'll be prompted to set up a profile. A profile is simply this: Which folders do you want to back up, where do you want to put them, and how do you want the backup to happen?

In the freeware version of SyncBack, you get one of two options to choose from: backup or synchronization (image J). Which one you choose is entirely up to you. The backup option works just like every other backup you've ever run: Files are copied from one location to another at a given interval you schedule or, for the lazy user, whenever you open SyncBack and run the profile.

A synchronization, on the other hand, is like a *Star Trek* replicator for your files. The second you make a change within a folder that SyncBack is scanning, the program will automatically perform the same operation on a target folder you specify. This includes adding files, deleting files, changing the contents of files—anything.

For the purposes of this article, we're going to work with the backup option. So select that, hit OK, and we'll keep going!



2 DEFINE THE BASICS

Once you've named your profile, you'll see SyncBack's default, basic mode for configuring the ins and outs of your backup profile (image K), but you don't need that. You're hardcore. Click the Expert button on the bottom of the window.

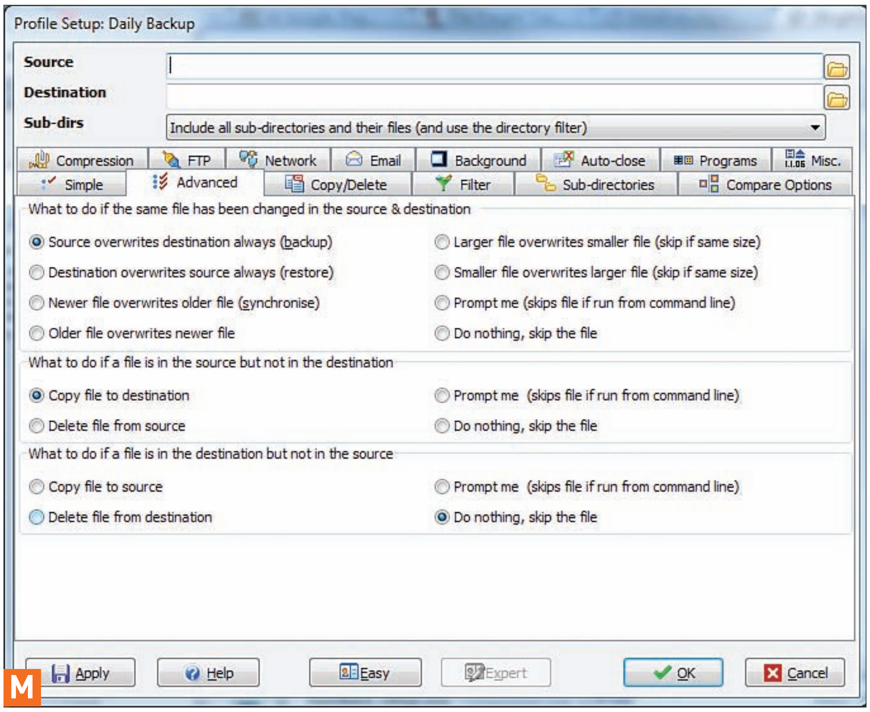
Whoa! A ton of new tabs and options open up before your very eyes (image L). We'll deal with them in a bit. For now, start your trip down backup lane by selecting which of the three options in the Simple tab best fits your file-copying needs. We're going to use the app to back up our specific Windows user folder, so we've selected the option that throws all subfolders of a target folder into the mix.

And while we're on the topic, be sure to select the source folder you'll be backing up at the top of SyncBack's Profile Setup window. Yes, you'll want to select the destination folder as well. Leave the subdirectories option just as it is for now: We'll customize our folder selections in a bit.

3 MANAGE YOUR OVERWRITES

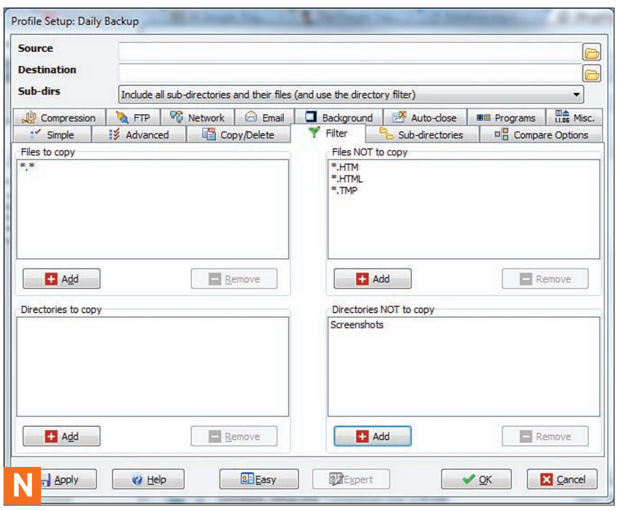
One of the most important configuration screens within SyncBack's Profile Setup window can be found on its Advanced tab (image M), for it's here where you'll set the specific rules that govern the various what-if situations that come up during a typical backup. Unlike a conventional backup application, SyncBack dumps your files into one folder, period. There's no way to maintain multiple backups over a given time period, per se.

What should SyncBack do if a file is on your source drive but not on your target? Send it on over! What should SyncBack do if it finds the same file on both? This is a backup: Overwrite the contents on the destination drive with the source file (either always, or only if the file is newer than the older version on the destination drive). And, our favorite, what should SyncBack do with all the files on the destination drive that are no longer matched on the source? We live dangerously—and we appreciate an uncluttered backup drive—so we say delete these. If you want to keep these legacy files around, however, you can certainly tell SyncBack to do so. The power is



yours, backupateer.

Again, we need to stress that we're selecting the options that make the most sense to us for our own backup profile: Your choices may—and will—vary, especially if you want to synchronize your folders instead.

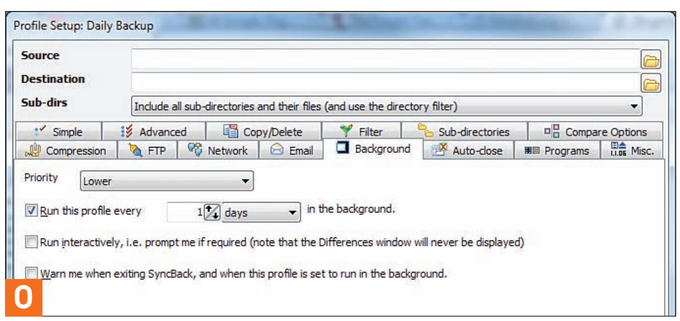


4 SET UP FILTERS

Tied for importance alongside SyncBack's Advanced tab is its Filter tab (image N) and, to a lesser degree, its Sub-directories tab. You'll use the former to select the specific files and folders you want to exclude from your backups. It seems counterintuitive—that you'd want to remove subfolders and files from the primary directory to be backed up—but hear us out.

In our case, we have a whole ton of information within our Windows user folder that we really don't need to duplicate. Links and Favorites? Unnecessary. Folders that have been created by third-party programs? Unchecked—we only want to back up the primary data that is otherwise irreplaceable on our drive. Those are just a couple examples.

As for files, do we really need to back up anything that ends in .tmp, .htm, or .html? Nope. What about .bak or .log files? Gone. To eliminate these, we merely need to introduce them into the "Files NOT to copy" screen by using a wildcard—*.tmp, for example—to remove them from our main backup.



It's a lot easier in our example—copying our Windows user folder—to go in and select only the direct folders within the Windows\Users\[our name] directory that we care about. You can do this in one of two ways: In the Sub-directories tab (after selecting the "Let me choose what sub-directories to include" option in the Sub-Dirs drop-down menu at the top of the Profile Setup window), or by adding these directories within the related option in the Filter tab. The first choice only excludes the specific folders you have not checked on the screen: Any new directories in the parent Source folder, created after the fact, will be added to the backup by default.

5 SET UP SCHEDULING

Confession time: You'll have to use Windows Task Manager to schedule SyncBack backups if you want them to happen when the program isn't running in the background of your operating system. That's a ton of work, and we actually don't mind having super-quick access to our backup profiles with a background-running SyncBack (accessed via an icon in the Windows taskbar).

So, we much prefer SyncBack's simple, "Run this profile every..." option, to be found within the Background tab of the Profile Setup screen (image O). Set the time interval in seconds, minutes, hours, or days, and SyncBack will automatically process your backup profile at whatever Windows priority level you set.

If you've used our previous tips to exclude folders and files that don't need to be backed up, you'll find that SyncBack's "every [interval]" backup scheduling is hardly irritating. But more importantly, you'll find a fresh version of your files on your backup location each and every time you need to access them—which, we hope, is quite rarely.

LENGTH OF TIME
1.5 HOURS

LEVEL OF DIFFICULTY
INTERMEDIATE

BUILD IT

A Petite 3D HTPC

We set out to build a Sandy Bridge box that takes up little space in our entertainment center and fulfills all our streaming needs



GORDON MAH UNG
SENIOR EDITOR

THE MISSION Back in the August 2010 issue of *Maximum PC* I built a 3D HTPC that I was pretty damned happy with, but the times have changed. The CableCard quad tuner that was featured prominently in that machine is no longer needed, as I have joined the ranks of the Cable Cutter Movement™. So without the need for a CableCard, I wondered if I could build a rig with all the same capabilities but make it much, much smaller.

INGREDIENTS

✔ **Case/PSU** Silverstone Lascala LC12 w/120W PSU	www.silverstonetek.com	$180
✔ **Mobo** Zotac H67-ITX WiFi	www.zotacusa.com	$160
✔ **CPU** Intel Core i3-2100T	www.intel.com	$130
✔ **Cooler** Silverstone NT07-1156	www.silverstonetek.com	$30
✔ **RAM** 4GB Corsair DDR/1333	www.corsair.com	$50
✔ **Optical Drive** Sony Optiarc BC-5640H-01	www.sonynec-optiarc.com	$160
✔ **Solid-State Drive** 60GB G.Skill Phoenix Pro	www.gskill.com	$130
✔ **OS** Windows 7 Home Premium 64-bit (OEM)	www.microsoft.com	$99
✔ **Misc** 2x USB header extension cables		$5
Total		**$944**



Picking the Best Parts for the Job

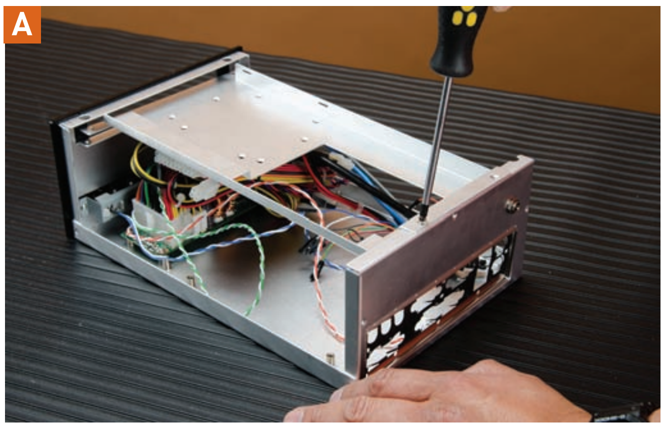
When Intel released its 2.5GHz Core i3-2100T chip, I thought I had a good place to start. Its integrated graphics processor supports 3D Blu-ray over HDMI 1.4 TV sets. Even better, the H67 chipset supports lossless audio. This let me dispense with both the discrete graphics card and soundcard that our previous 3D HTPC required.

The Core i3-2100T is also the coolest desktop Sandy Bridge CPU out today. With a TDP rating of 35 watts, it's nearly half as hot as the other dual-core Sandy Bridge desktop chips. I consider AMD's Fusion to be the natural successor to Atom, but I still find it a wee bit slow for desktop use.

For the case, Silverstone's Lascala LC12 seemed to fit the bill. It's not as small as some HTPC boxes, but depth usually isn't an issue on home theater racks. The stock LC12 comes with a 60W brick that does not include an ATX12V connector (the original Mini-ITX form factor didn't call for it), so we upgraded to the 120W PSU from Silverstone. The case should accommodate the standard heatsink that comes with the chip, but I thought I'd cut down on noise with the Silverstone NT07 low-profile cooler. Besides sitting lower, it also offers a switch to manually lower fan speed for quieter performance. As for the motherboard, Zotac's boards have been leading the way in the Mini-ITX revolution, and the H67-ITX WiFi gives me 802.11n, LGA1155 support, and full-size DIMM slots.

I decided against a mechanical hard drive for this build, as I find that components on my theater rack often get jostled while they're running. An SSD eliminates worries about head crashes, and with the Zotac board the 60GB G.Skill Phoenix drive will boot in less than 20 seconds. There's also no need for tons of local storage, since I'll mostly be streaming from a server or the Internet and there's no TV tuner to record from.

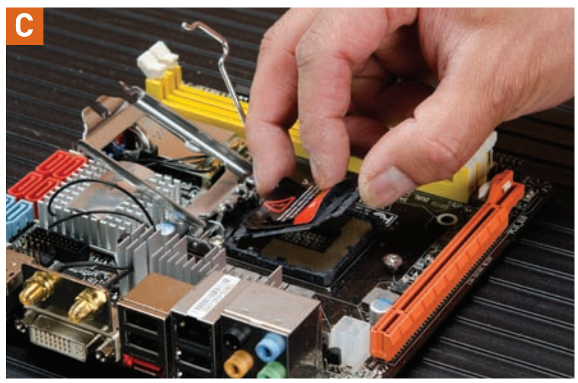
The final piece was a Sony BC-5640H slot-fed Blu-ray combo drive, which helps class up the machine a bit. Tray versions are cheaper and easier to find, but not as slick.





1 REMOVE THE DRIVE CAGE

The LC12 breaks down into two pieces: The top tray holds the ODD and SSD and adds strength to the aluminum frame. To begin the build, you need to remove the top tray by removing two screws at the rear of the cage (image A), and two at the front. Set these screws aside in a small cup so you don't lose them.



2 INSTALL THE I/O SHIELD

Remove the stock I/O shield (that's the fancy name for the metal plate at the back of the case) and install the I/O shield that came with your motherboard (image B).



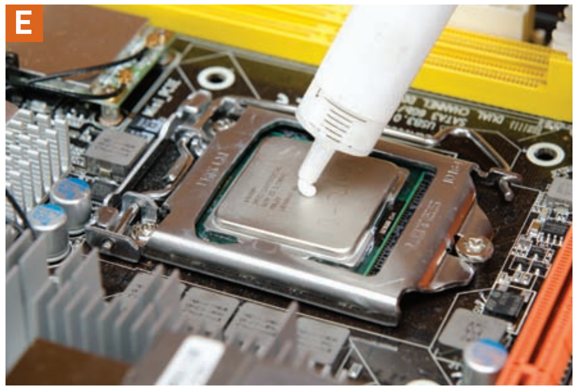
3 INSTALL THE CPU

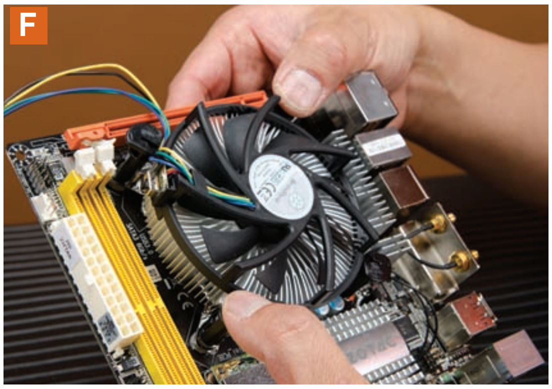
Set the case aside and grab the Zotac motherboard. To install the CPU, first unlock the load plate on the CPU socket. Once that's off, remove the plastic cover protecting the delicate pins in the socket (image C). Save the cover. If you ever need to return the board, the manufacturer will not accept it without the cover. Use two fingers to hold the CPU parallel to the socket, with the notches on both lined up (image D). Gently lower the CPU straight into the socket. Do not drop one half of the chip into the socket and then slide it around. Once the chip is seated, lower the load plate and lock it with the arm.

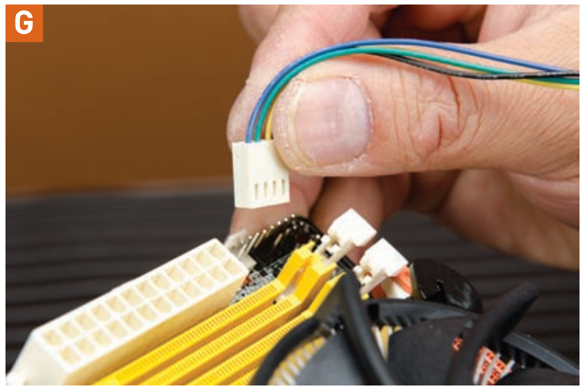
4 INSTALL THE COOLER

Remove the plastic backing from the copper slug on the heatsink. Apply a pea-size amount of thermal paste on the CPU's heat spreader (image E). If you're anal, you can put your finger inside a plastic bag to spread the thermal paste evenly over the heat spreader.

Now install the heatsink. Each of the locking pins surrounding the heatsink should protrude through the bottom of the motherboard. Using your thumbs, push down on the four locking mechanisms until they lock into place with a click—do opposite pins first (image F). When done, check all to ensure they have locked into place. Once the heatsink is in place, plug the fan into the 4-pin header marked CPU Fan (image G).


E


F


G

5 INSTALL THE RAM

We elected to use 4GB of RAM, which is more than enough for an HTPC. To install the RAM, spread out the locking arms on either side of the slot, line up the notches on the RAM and the slot, and push down on either end of the DIMM until it locks into place (image H).



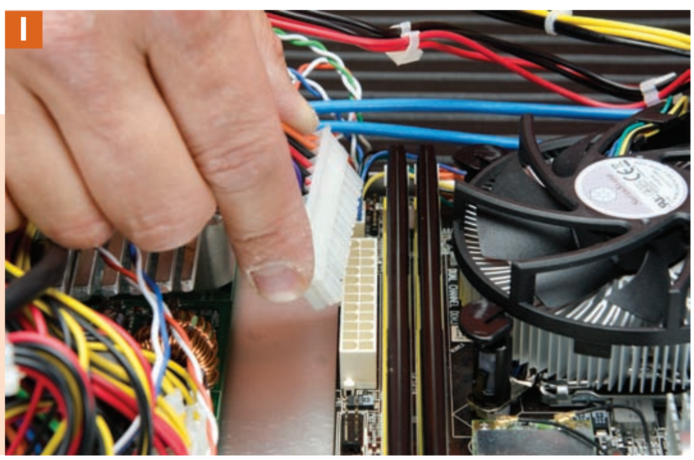
H

6 INSTALL THE MOTHERBOARD

Lower the motherboard into the chassis and use four screws to screw it in place. Use enough torque so the screws do not back out from the vibration of the system.

7 HOOK UP POWER

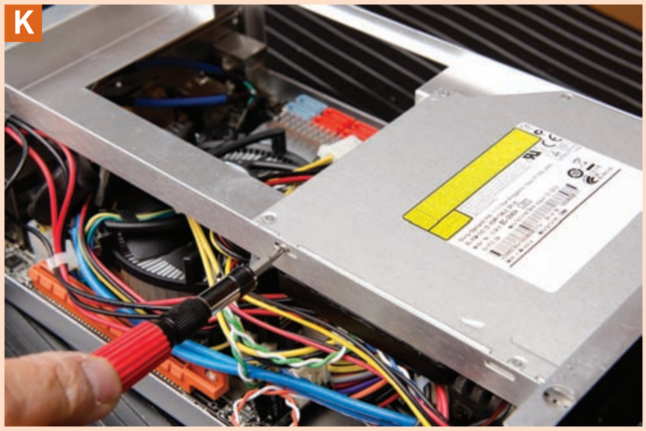
Hook up the 24-pin main power connector (image I) as well as the ATX12V connector. Both rookies and old salts will occasionally forget to plug in the ATX12V connector, so if your system won't boot, you should make sure that this commonly overlooked connector is plugged in.


I

8 PLUG IN THE USB EXTENSIONS

The LC12 has a wee problem with the USB header placement on the Zotac mobo: They don't quite reach. To get around this, we used two USB extension cables, available from Silverstone, or from most stores that cater to modders, for a few bucks apiece. Oddly, the LC12 features old-school individual leads for USB. Match each of these leads to their counterparts on the extension cable, then plug them into the USB headers. The AC97 front-panel audio will also need a short extension if you intend to access the front headphone jacks. Since this PC will be used in the living room, we skipped it. Once you're done with that, it's time to hook up the front-panel connectors. The power and reset switches and HDD LED follow the standard Intel-mandated pinout.


J


K

9 INSTALL THE SSD AND ODD

Now attach the SSD to the drive cage that you set aside earlier (image J). Once you have it mounted, reinstall the cage on top of the system. When you have the cage mounted, plug the SSD into any of the available SATA ports on the motherboard.

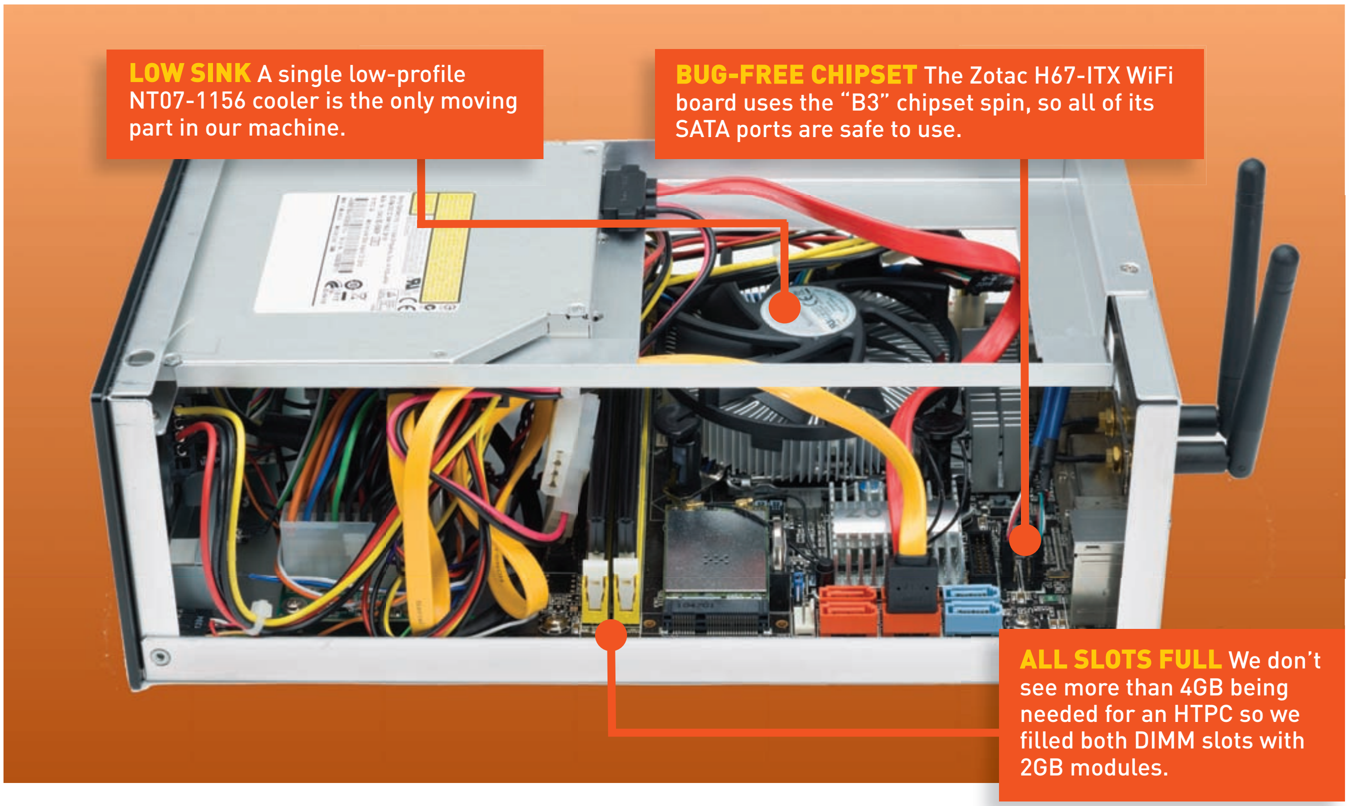
Carefully slide the Sony Blu-ray drive into the front of the system. Use two of the very small screws to lock the optical drive in place (image K). When you're done, use the included slimline SATA adapter to hook up the optical drive's power and data lines.

10 INSTALL THE ANTENNAS

The last step is to install the two 802.11n antennas to the back of the case (Image L). Congratulations, you're now done!


L





The Petite HTPC in Action

We decided to subject our petite 3D HPTC to the same tests we've been running on HTPC-class machines for the past year. The tests aren't always apples-to-apples comparisons, as the amount of RAM varies and the storage subsystems are different, but they give a good feel for what kind of performance to expect from a given processor/graphics combination. The AMD Phenom X4 quad core in the Mvix Minix 890GX (May 2011) represents well in the multithreaded tests but it isn't as far in front of the Core i3-2100T as we would have expected. The mobile GeForce GT 425M in Asrock's Vision 3D (March 2011) roundly thumps the integrated graphics of the rest of the pack. While the Sandy Bridge-powered HTPC flies past the AMD Fusion–powered MSI E350IA (April 2011) in compute-limited tasks, in graphics, the Fusion holds up well for a chip that is 900MHz slower in clock speed. Perhaps I've been too hard on Fusion in desktop applications.

AFTER-ACTION REPORT

Whenever we finish a project, we wonder if we took the right path. We're happy with the petite 3D HTPC's results, but the rig could be improved. I've bagged on Atom- and Fusion-based parts for weak performance, but one thing those lighter-weight chips give you is lower temperatures. I thought the 35-watt Core i3 would run cool, and thus I got a bit greedy in my quest to use only one fan. While I didn't have problems with the Core i3-2100T / LC12 combination, it does run a bit warm. I tuned the fan speeds to balance acoustics and thermals, but in the end I decided to let it run warm. Intel processors throttle if they overheat, and during testing ours never throttled. Still, I'm not totally satisfied with the temps, and I'm thinking that I should have gone with another option I had considered: Antec's ISK 300-150, which features an 8cm fan but is slightly bulkier and uses a PSU with a fan.

BENCHMARKS

	Petite HTPC	Minix 890GX-USB3	MSI E350IA-E45	Dell Inspiron Zino	Polywell Giada Ion-100	Asrock Vision 3D
CPU	2.5GHz Core i3-2100T	2.6GHz Phenom II X4 910e	1.6GHz E350	1.5GHz Athlon X2 3250e	1.3GHz Atom 330	2.4GHz Core i3-370M
GPU	Integrated Intel	Integrated Radeon HD 4290	Integrated Radeon HD 6310	Integrated Radeon HD 3200	Integrated Nvidia Ion	GeForce GT 425M
Photoshop CS3 (sec)	**122**	150	438	449	552	162
MainConcept (sec)	2,049	**1,806**	4,604	7,080	8,858	2,452
3DMark 2003	7,940	5,269	6,403	2,540	3,371	**17,394**
Quake III (fps)	223	284	193	192	118	**537**
Quake 4 (fps)	41	37	43	29	29	**112**

Best scores are bolded. All tests were run on Windows 7.

REVIEWS

Tested. Reviewed. Verdictized.



INSIDE

ONLINE

- **EVEN MORE REVIEWS!**
- **BEST OF THE BEST**
- **BREAKING TECH NEWS**
- **NO BS PODCAST**

Polywell Ignition X5800

Polywell's latest packs a surprise GPU



White is really the new black.

Here at *Maximum PC*, we adhere to the cable news statistics rule that two data points is all you need to create a trend. So being presented with the second white system we've seen in the last three months, we can now declare that white is the new black (which was the new beige).

And, (Kent Brockman voice-over) it's a trend we like. Far from gaudy, Polywell's Ignition X5800 manages to look powerful, stately, and professional. It's an appropriate aesthetic coming from a company with a long history of making computers for work. For 24 years, Polywell has cranked out workstations, servers, and even Alpha-based rigs.

Those workstation roots seem to influence the rig's interior as well, with Polywell opting for Intel's 3.46GHz Core i7-990X six-core processor conservatively overclocked to 4GHz. The 990X is coupled with Asus's Sabertooth X58, 6GB of DDR3/1600, a 128GB Crucial C300 SSD, and a 2TB Hitachi, er, Western Digital hard drive. The big surprise is its GPU. Given that AMD was the first graphics company out with a new dual-GPU card, we expected to find the Radeon HD 6990 in Polywell's rig. When we cracked open the case, we instead were treated to Nvidia's top new dual-GPU offering, the GeForce GTX 590. Why no Radeon HD 6990 card? Perhaps it's the result of vendor/supplier relationships, or just a matter of preference, but we do wonder if something isn't up with the Radeon HD 6990. After all, if you glance through the magazine this month, you'll find a review of Asus's GTX 590, but nothing for AMD's hot new card. That's because no cards were available for review.

We'll leave the issue to the armchair analysts. Instead we'll concentrate on how the Polywell X5800 performs.

Against our current zero-point rig, a Core i7-920 overclocked to 3.5GHz, there's not much of a contest. The Polywell X5800 roasts the quad-core 920 in everything by double-digit numbers. The closest the zero-point came was in our Adobe Lightroom benchmark, where the Polywell aces it by just 11 percent. Lightroom isn't very multithreaded and is mostly clock-speed dependent. The Polywell is clocked about 13 percent higher, so the 11 percent advantage is about right. In gaming, the GTX 590 easily surpasses the old dual-GPU Radeon HD 5970 card by huge margins. STALKER: CoP saw it 76 percent faster and Far Cry 2 (which is more dependent on CPU performance these days) also saw a nice 51 percent boost. But what about more current rigs? Perhaps the best comparison is the Sandy Bridge–based Digital Storm Black Ops Enix we reviewed in April. Clocked 700MHz higher, with its Turbo Boost 2 taking it to 5.2GHz, the Enix manages to get ahead of the X5800 in all six benchmarks. However, in three of the benchmarks—Vegas Pro 9, MainConcept Reference, and Far Cry 2—it's surprisingly close considering the clock differences.

While it's certainly not a price breakthrough, Polywell's X5800 should be given credit for offering both a 990X and what's essentially the performance of GTX 580 cards in SLI in a $3,500 box. It's still a tough sell against the onslaught of über-clocked Sandy Bridge–based systems that are now back on the market, but it's at least respectable. **–GORDON MAH UNG**

SPECIFICATIONS

Processor	Intel 3.46GHz Core i7-990X overclocked to 4GHz
Mobo	Asus Sabertooth X58
RAM	6GB DDR3/1600 in tri-channel mode
Videocard	GeForce GTX 590
Soundcard	Onboard
Storage	Crucial 128GB C300, 2TB Hitachi Deskstar
Optical	LG GGC-H20L
Case/PSU	Ignition / Thermaltake 1,200 watt

BENCHMARKS

	ZERO POINT	
Vegas Pro 9 (sec)	3,049	2,311
Lightroom 2.6 (sec)	356	322
ProShow 4 (sec)	1,112	957
Reference 1.6 (sec)	2,113	1,622
STALKER: CoP (fps)	42.0	74
Far Cry 2 (fps)	114.4	173

0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our current desktop test bed consists of a quad-core 2.66GHz Core i7-920 overclocked to 3.5GHz, 6GB of Corsair DDR3/1333 overclocked to 1,750MHz, on a Gigabyte X58 motherboard. We are running an ATI Radeon HD 5970 graphics card, a 160GB Intel X25-M SSD, and the 64-bit version of Windows 7 Ultimate.

POLYWELL X5800 — VERDICT **8**

+ THE WHITE SHADOW	– COACH
Fairly quiet under load and quite pleasing to the eye.	990X at conservative overclocks can't go toe-to-toe with high-clocked Sandy Bridge.

$3,500, www.polywell.com

Eurocom Panther 2.0

This luggable hulk tore through our benchmarks



If performance trumps portability, this mobile workstation is the fastest, most flexible system you'll find anywhere.

Riddle me this: When is a portable PC not a laptop? When it's so heavy you're afraid if you put it on your lap you'll never be able to get up again. Though we wish Eurocom's Panther 2.0 had shipped with a weightlifter's belt, our testing left little doubt that the chiropractor bills will be worth it. This outlandishly large machine has the power and flexibility of a true no-compromise mobile workstation.

To be fair, in 1983 the original Compaq Portable weighed in at around 28 pounds—this behemoth weighs just 15 pounds, including the power supply. However, instead of a 9-inch monochrome monitor, you get a 17.3-inch, 1920x1080 pixel, LED-backlit display. That's full HD resolution—combined with the Blu-ray player, five speakers, and a subwoofer, you've got yourself a portable movie theater, as well.

It's not the 17-inch monitor, though, that sets this machine apart. The size and weight are necessary to support the power and features of a desktop PC. The rig is engineered to run desktop and workstation-class CPUs; our test system sported a Core i7-980X Extreme running at 3.33GHz with six cores, but the platform supports Xeon processors as well. Two AMD Radeon HD 6970M XT graphics cards, each with 2GB of GDDR5, work together with CrossFire technology.

Our test system included 12GB of RAM and two drives, one 256GB solid-state drive and one 500GB 7,200rpm hybrid drive. If that's not enough, there's room to expand with two more, and the system supports RAID 0, 1, 5, and 10 configurations. Even the CPU and graphics cards can be upgraded; this is one of the most expandable and upgradeable mobile systems we've ever tested.

As you'd expect from those specs, the system blew through our tests. Whether in CPU, graphics, or I/O-intensive tasks, it will run with all but the top overclocked, gaming desktop machines. Upping the resolution on our Call of Duty 4 test to 1920x1080 didn't even phase this system; it still delivered 191fps. The only test where it fell down was the battery drain test; we only made it through 30 minutes of a DVD before the battery gave up.

At 16.76x11.44x2.43 inches, the Panther's as bulky as it is heavy. All of that surface area, though, is put to good use. The keyboard is large, with a separate numeric keypad. There are two USB 3.0 ports, three USB 2.0 ports, an eSATA port, FireWire, DVI, HDMI-out, and HDMI-in so you can play your Xbox on the big screen.

When we tested the Malibal Nine X7200 built on the same platform (Holiday 2010), we gave it a Kick Ass award. The Panther 2.0 has even more impressive specs, easily earning the award. Its size, weight, and limited battery life make it appropriate for only a small subset of users, but its performance and flexibility define a new class of mobile gaming systems.

—KEN FEINSTEIN

SPECIFICATIONS

CPU	3.3GHz Intel Core i7-980X
RAM	16GB DDR3
Chipset	Intel X58
Drives	Micron 256GB SSD SATA 600 RealSSD C300, 500GB 7,200rpm hybrid, SATA 300
Optical	Hitachi-LG CT10N Blu-ray player
GPU	2x AMD Radeon HD 6970M XT, 2GB
Display	17.3-inch, LED-backlit, 1920x1080
Connectivity	HDMI out, HDMI in, DVI, Ethernet, two USB 3.0, three USB 2.0, eSATA, FireWire, Bluetooth, Wi-Fi, headphone, mic, line-in, S/PDIF out, media reader, webcam, fingerprint sensor
Lap/Carry	13 lb, 3.2 oz / 16 lbs, 8.7 oz

BENCHMARKS

	ZERO POINT	
Premiere Pro CS3 (sec)	1,320	480
Photoshop CS3 (sec)	153	80
Proshow Producer (sec)	1,524	457
MainConcept (sec)	2,695	894.6
Far Cry (fps)	32.7	123.71 (+155.1%)
Call of Duty 4 (fps)	58.2	206.4 (+231.8%)
Battery Life (min)	100	30 (-68.8%)

0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our zero-point notebook is an Asus G73Jw-A1 with a 1.73GHz Intel Core i7-740QM, 8GB DDR3/1066, two 500GB Seagate 7,200rpm hard drives, a GeForce GTX 460M, and Windows 7 Home Premium 64-bit. Far Cry 2 tested at 1680x1050 with 4x AA; Call of Duty tested at 1680x1050 with 4x AA and 4x anisotropic filtering.

MAXIMUMPC KICK ASS!

VERDICT 9

EUROCOM PANTHER 2.0

+ WEIGHT TRAINING

Desktop-class performance; room for four hard drives; upgradeable CPU and graphics.

− DEAD WEIGHT

Extremely heavy; very short battery life; no 990X?

$5,373. www.eurocom.com

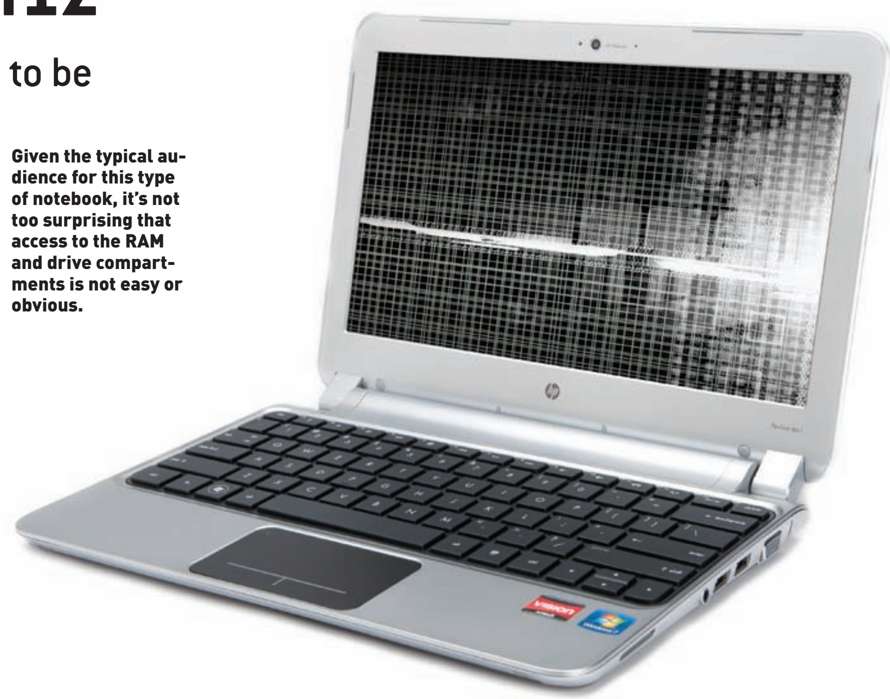
HP Pavilion dm1z

What netbooks were meant to be

We're not living so close to the cutting edge here at *Maximum PC* that we can't see the utility of a no-frills, budget portable that's capable of performing all the common day-to-day computing tasks. Whether it serves as a secondary machine for work on-the-go or as a primary PC for a school-age kid, we get it. It's the same need that netbooks were meant to fulfill, if only they hadn't fallen short of the mark. What netbooks taught us is that today's common computing tasks—which include things like gaming and high-def video playback—require more power than an Atom processor and integrated graphics can muster.

AMD's Fusion offers a more viable option, as evidenced by HP's Pavilion dm1z—an 11.6-inch portable that starts at $450. The notebook's E-350 chip comprises a 1.6GHz dual-core processor and a Radeon HD DX11-capable graphics part on the same die. Compared to the 1.6GHz N270 Atom in our standard zero-point netbook (a Lenovo IdeaPad S12)—well, there is no comparison, only horrific carnage. The N270 gets slaughtered by more than 50 percent in content-creation chores and three-digit margins too embarrassing to repeat in our gaming tests. Instead, we measured the Pavilion dm1z against the very best Atom-based netbook we've tested to date, the Asus 1215N (reviewed December 2010). The 1215N is an outlier in the category with a 1.8GHz Atom D525 (a dual-core with Hyper-Threading) and Nvidia's Ion discrete graphics chip. At the time of its review, it was priced similarly to the dm1z config reviewed here.

The dm1z doesn't run away with the win, but it does surpass the 1215N in the majority of the benchmarks, most notably by nearly 45 percent in 3DMark03 and 50 percent in Quake III. Before you start objecting that Quake III hardly counts as a game these days, we'll point out that the dm1z's score of 38.5fps in Quake 4 isn't too shabby for a notebook of this size and price. What's more, Call of Duty 4 was playable at the notebook's 1366x768 native res.



Given the typical audience for this type of notebook, it's not too surprising that access to the RAM and drive compartments is not easy or obvious.

The only benchmarks that the dm1z ceded to the 1215N were MainConcept, where the latter's four processing threads gave it the advantage, and in battery life, where the 1215N's Optimus technology was able to disable the discrete graphics and eke out an additional hour of juice in our video rundown test.

While Fusion will never be as power efficient as an Atom chip, we'd still happily exchange some battery life for greater performance versatility. That versatility also includes HD video playback, both online and via a Blu-ray player. The dm1z doesn't come with an internal optical drive, but an external BD combo drive is an option for $130.

What does come stock are a glossy screen, a full-size island keyboard, VGA, HDMI, three USB 2.0 ports, a media reader, and 802.11n Wi-Fi. Build quality feels fairly solid and the screen reclines a full 180 degrees on a seemingly sturdy hinge.

All and all, it's a well-rounded value package, although we're surprised it's not actually a bit cheaper considering that there's no overhead for a discrete graphics chip. Nevertheless, if you want a small, inexpensive, versatile notebook, this is it. –KATHERINE STEVENSON

SPECIFICATIONS

Processor	AMD 1.6GHz E-350
Chipset	AMD A40/A50
RAM	3GB DDR3/667
Graphics	AMD Radeon HD 6310
Display	11.6-inch, LED-backlit, 1366x768
Storage	320GB 7,200rpm HDD
Connectivity	VGA, HDMI, three USB 2.0, multicard reader, Ethernet, 802.11n Wi-Fi, Bluetooth, webcam, audio in/out
Lap / Carry Weight	3 lbs, 7 oz / 4 lbs, 3.2 oz

BENCHMARKS

	ZERO POINT	
Premiere Pro CS3 (sec)	470	439
MainConcept (min)	120	134 (-10.4%)
3DMark03	3,898	5,648
Quake III (fps)	104.4	155.7
Quake 4 (fps)	36.5	38.5
Battery Life (mins)	307	227 (-26.1%)

0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our zero-point netbook is an Asus 1215N with a 1.8GHz Atom D525, Nvidia Ion graphics, 2GB of DDR2/800 RAM, a 250GB 5,400rpm HDD, and Windows 7 Starter.

MAXIMUMPC KICK ASS!

HP PAVILION DM1Z

VERDICT 9

+ WINDFALL
Performance that puts most netbooks to shame; good value.

– DOWNPOUR
Battery life isn't stellar; limited in multi-threaded apps.

$480, www.hp.com

Gigabyte G1.Assassin

The ultimate X58 motherboard?

Gigabyte really went all out with the weapon-themed G1.Assassin board, but for folks who don't know: It's a motherboard, not a weapon. Repeat: not a weapon.

And just in case someone thought you could somehow slap the magazine-shaped heatsink into your M4A1 and start rocking the happy switch, you can't. Gigabyte says as much with a warning label on the end of the heatsink/magazine: "Heatsink: Not a weapon. Cannot be assembled as a weapon."

One thing is for sure: The G1.Assassin might very well be the most stacked and packed X58 motherboard available today. Three factors lead us to this conclusion: The board follows the not-quite-homologated XL-ATX size and measures a whopping 13.58x10.35 inches; it features a real Creative Sound Blaster X-Fi 20K2 chip; and it's the first board we know of that uses an onboard Bigfoot Networks Killer NIC E2100.

The eyebrow raiser is, of course, the Killer NIC E2100. The card promises lower ping times and higher frame rates but its ability to live up to that promise has never been universally agreed upon. While some reviewers have said it can cough up extra frames and lower pings, others (including *Maximum PC*) have maintained that the difference hasn't been worth the price of admission.

That's also what a lot of gamers are saying about Creative's X-Fi cards these days. Once a must-have for any serious gamer, today many PC builders forego an add-on soundcard for the free onboard variety.

That's where the G1.Assassin gets really interesting, though. If you are theoretically getting an X-Fi Titanium, which is worth about $99, and the Killer NIC E2100 (worth about $90), that should make the board a steal, right? Well, here's the dig. The G1.Assassin tips the scales at $530, which makes it the priciest X58 board we know of.

To be fair, you are still getting a lot for your money with the G1.Assassin (assuming, of course, that you had your heart set on buying the Killer NIC and X-Fi). Besides the X-Fi and Bigfoot chips, Gigabyte gives you eight USB 3.0 ports (four with header) by way of an NEC/VIA controller/hub combo and SATA 6Gb/s by way of a Marvell 9128 chip. There's no love for eSATA, but few will likely miss it.

One other feature glaringly missing from the G1.Assassin is support for four-way SLI. The board features four x16 physical slots, which can be configured to support SLI, tri-SLI, CrossFireX, or quad CrossFireX. Why no four-way SLI? That's likely because Gigabyte didn't include Nvidia's nForce 200 chips, which would have driven the cost up even more.

In performance, it's a wash. As always, performance margins are rarely a deciding factor (although the Intel DX58SO2 board represents well here). It's about features. If you intend to build an all-out, over-the-top X58 system, the G1.Assassin isn't a bad pick. Just know that you also need to buy an XL-ATX case for it. If that's a turn-off, the G1.Sniper is the same board but on standard ATX and lacking support for four GPUs. You should also know that LGA1366 is a dead man walking at this point.

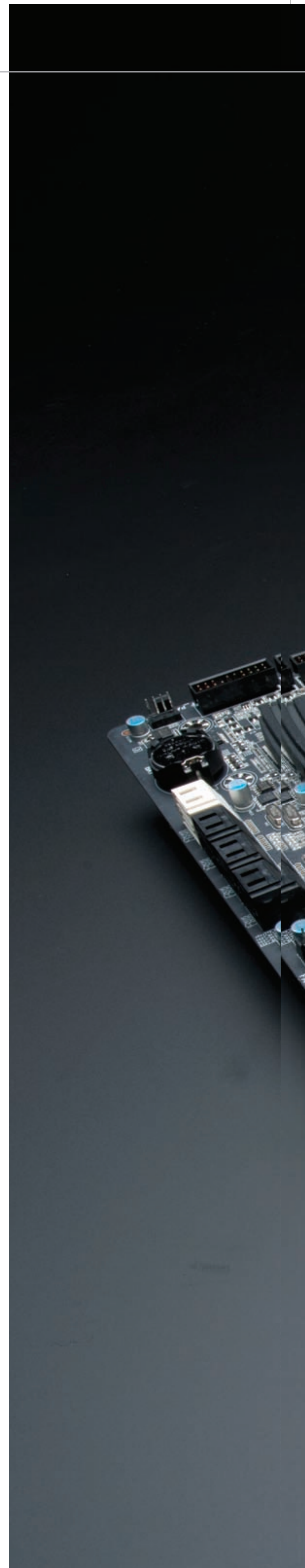
So, while we give Gigabyte props for going hog-wild crazy, a lot of people are going to question if the timing of it is right or not. –GORDON MAH UNG

VERDICT 8

GIGABYTE G1.ASSASSIN

+ THE PROFESSIONAL	– JASON BOURNE
A "free" Killer NIC and X-Fi make for a nice bonus.	Where's the four-way SLI?

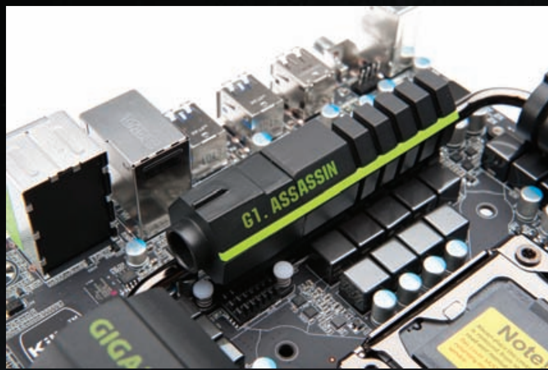
$530, www.gigabyte.com



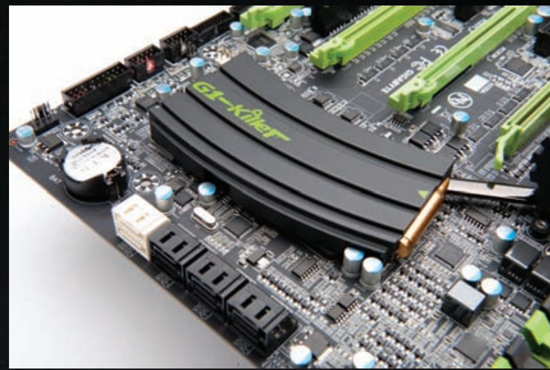
BENCHMARKS

	Gigabyte G1. Assassin	Intel DX58SO2	Gigabyte GA-X58-USB3	Asus Sabertooth X58	Asus Rampage III Extreme
PCMark Vantage 64-bit Overall	8,993	**9,902**	8,930	8,827	8,940
Everest Ultimate Mem Copy (MB/s)	16,269	16,351	16,904	16,727	**17,062**
Everest Ultimate Mem Latency (ns)	59	**56.7**	60.2	60.4	60.5
SiSoft Sandra RAM Bandwidth (GB/s)	22.4	23.3	22.7	22.7	23
3DMark Vantage Overall	**15,621**	15,371	15,371	15,498	15,443
3DMark Vantage GPU	**14,892**	14,573	14,590	14,708	14,640
3DMark Vantage CPU	18,308	**18,542**	18,310	18,473	18,483
Valve Particle Test (fps)	143	144	**149**	148	**149**
Resident Evil 5 low-res (fps)	**127**	126.2	125.3	**128**	126.7
HAWX low-res (fps)	167	175	170	175	174
HD Tune Pro Sustained Read (MB/s)	99	**107**	104	100	102
HD Tune Pro Burst (MB/s)	175	170	**189**	177	172

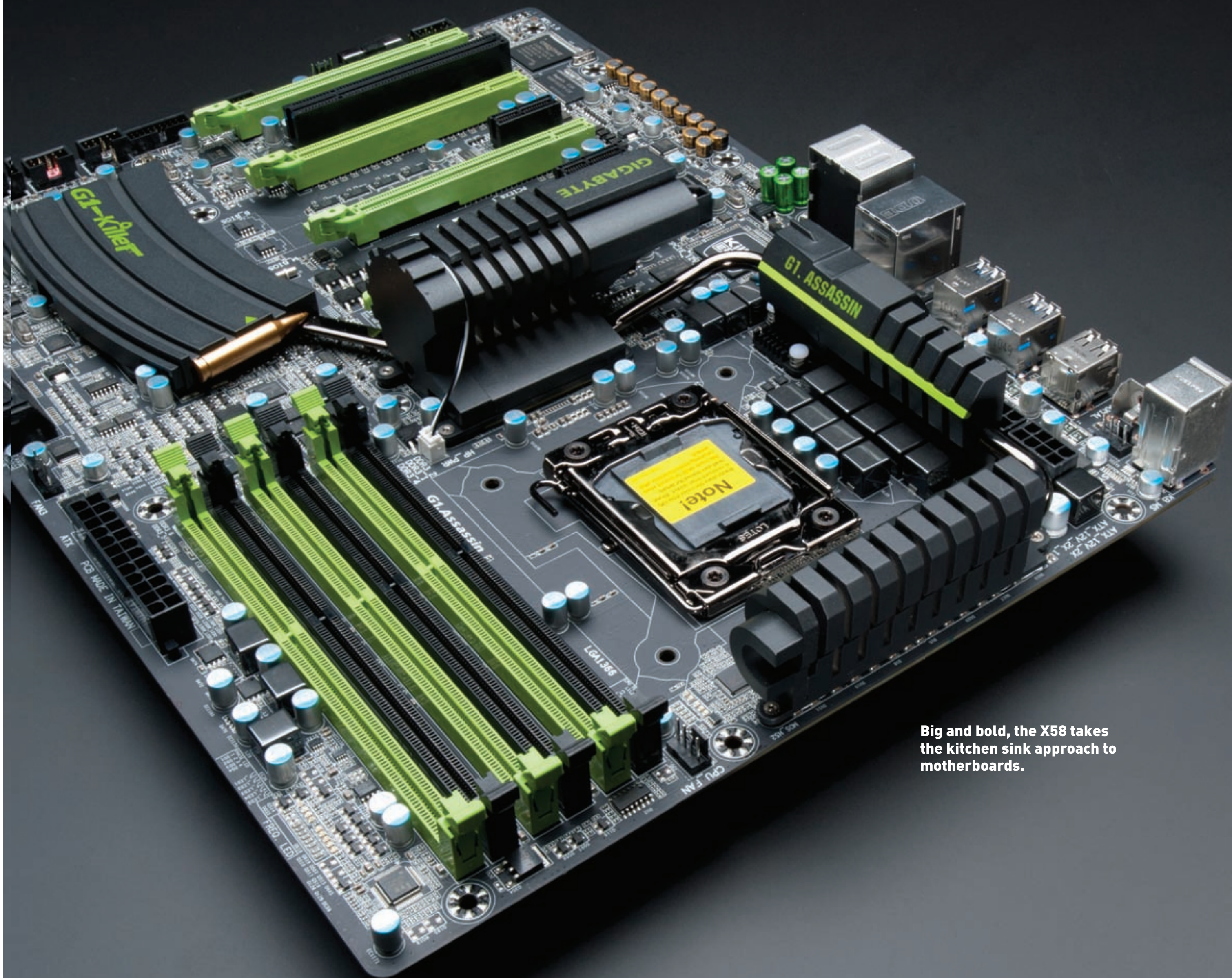
Best scores are bolded. Tests were conducted using an Intel 2.8GHz Core i7-930, 6GB of Corsair DD3/1333, an AMD Radeon HD 5850, a 1TB Western Digital Caviar Black, and 64-bit Windows 7 Professional.



Straight out of a James Bond movie, the G1.Assassin "barrel" actually helps keep the voltage regulators cool.



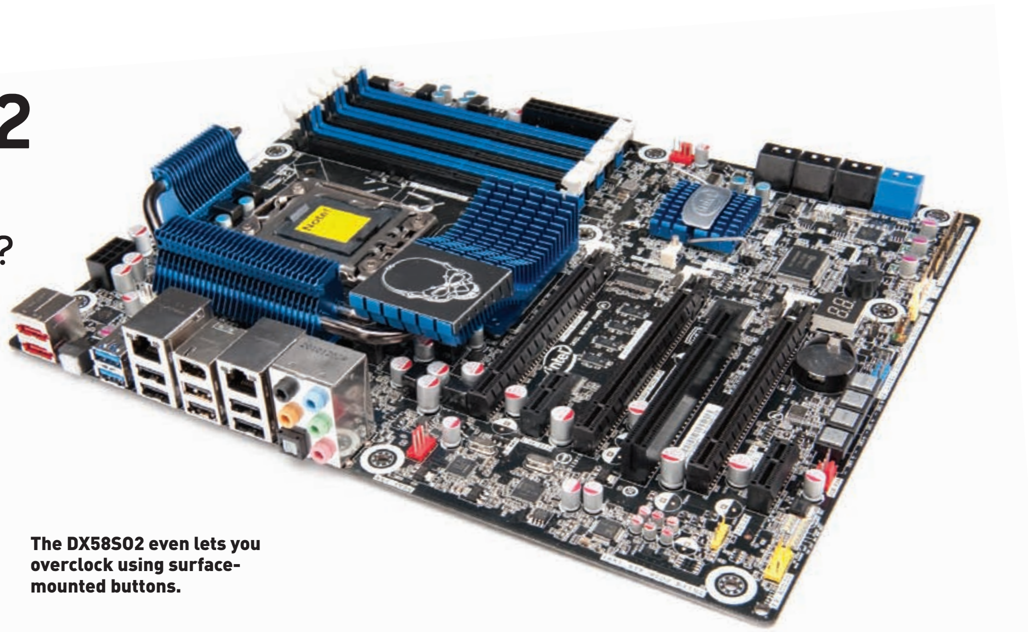
Do not insert this in your carbine and expect it to work.



Big and bold, the X58 takes the kitchen sink approach to motherboards.

Intel DX58SO2

Can Intel's board division shake its ho-hum history?



The DX58SO2 even lets you overclock using surface-mounted buttons.

Using the words "Intel motherboard" and "enthusiast" in the same sentence is like the old oxymoron "military intelligence." It just doesn't ring true.

Intel's reputation might finally be on the mend with its new DX58SO2, or "Smackover 2," which makes huge leaps over its predecessor, the DX58SO.

First up: the SATA ports. The original DX58SO had SATA ports that pointed straight up. That's an epic fail if you plan to run multiple GPUs. The DX58SO2 fixes that by placing all eight ports at right angles. Perhaps the biggest problem with the original Smackover was its paltry four slots for memory instead of the customary six slots that all the other enthusiast boards had at the time. We're happy to report that this new version sports the requisite six.

But that's not all of the improvements. SLI, CrossFireX, and even tri-SLI are now supported out of the box. Furthermore, the original board required several wacky power connectors for multi-GPU configurations, and the overall placement of everything was strange. The Smackover 2 has none of that. The only thing to complain about is the placement of the x16 PCI-E slots. If you run two GPUs (most commonly in the form of dual videocards), you block access to the sole PCI slot. That's a non-issue for most of us in this post-PCI world.

Additional enthusiast features include a full complement of surface-mounted switches for power, reset, and tweaking the base clock. Intel also tosses in a POST LED, which displays numbers that correspond to the individual steps of the boot process; a handy guide details what the cryptic numbers mean.

The X58 "Tylersburg" chipset is ancient at this point, so Intel beefs it up to current specs by adding an NEC USB 3.0 controller and a Marvell SATA 6Gb/s chip. One thing Intel missed, however, was support for the new USB 3.0 header.

A board's quality doesn't revolve entirely around how components are laid out, however: We also consider the bundled utilities and the polish each maker puts into its product. Intel mostly gets it right. The company's XTU tuning utility has matured nicely and its Desktop Utilities for monitoring the system work well. We also found the company's bureaucratically named Integrator Assistant useful; it sounds like an accounting inventory utility but can be used to update the BIOS or tweak it from within the OS.

In performance, the board is no slouch. As we've been saying for some time, performance within the same chipset family rarely varies. Oddly, the Smackover 2 ran faster in PC Mark Vantage and a few of our memory benchmarks. Elsewhere, it was dead even with the last four X58 boards we've tested.

So, again, performance is not an issue. It's about features and the warm, safe embrace of Intel. In this department, the board is on par with typical enthusiast boards out there in the same price range. **–GORDON MAH UNG**

INTEL DX58SO2 — **VERDICT 8**

+ WILLIS	**– BRUCE WILLIS**
Tri-SLI at an affordable price and the safe Intel name.	No included documentation; utilities must be downloaded.

$250, www.intel.com

BENCHMARKS

	Intel DX58SO2	Gigabyte GA-X58-USB3	Asus Sabertooth X58	Gigabyte X58-UD7	Asus Rampage III Extreme
PCMark Vantage 64-bit Overall	**9,902**	8,930	8,827	8,993	8,940
Everest Ultimate Mem Read (MB/s)	**16,011**	14,668	14,310	14,618	14,628
Everest Ultimate Mem Write (MB/s)	**14,797**	12,078	11,962	12,076	12,194
Everest Ultimate Mem Copy (MB/s)	16,351	16,904	16,727	16,470	**17,062**
Everest Ultimate Mem Latency (ns)	**56.7**	60.2	60.4	59.8	60.5
SiSoft Sandra RAM Bandwidth (GB/s)	23.3	22.7	22.7	22.8	23
3DMark Vantage Overall	15,371	15,371	15,498	**15,549**	15,443
3DMark Vantage GPU	14,573	14,590	**14,708**	14,643	14,640
3DMark Vantage CPU	18,542	18,310	18,473	**18,618**	18,483
Valve Particle Test (fps)	144	149	148	149	149
Resident Evil 5 low-res (fps)	126.2	125.3	128	130.1	126.7
HAWX low-res (fps)	175	170	175	175	174
HD Tune Pro Sustained Read (MB/s)	**107**	104	100	99	102
HD Tune Pro Burst (MB/s)	170	**189**	177	137	172

Best scores are bolded. Tests were conducted using an Intel 2.8GHz Core i7-930, 6GB of Corsair DD3/1333, an AMD Radeon HD 5850, a 1TB Western Digital Caviar Black, and 64-bit Windows 7 Professional.

Asus GTX 590

Nvidia's dual Fermi duels AMD's dual card



The Asus GTX 590 finally gives Nvidia triple-monitor fans a single-card solution.

Hot on the heels of AMD's Radeon HD 6990 dual-GPU monster, Nvidia is putting pedal to the metal with its own dual-GPU videocard. The GTX 590 implements a pair of full GF110 GPUs, each with its own 1.5GB of dedicated GDDR5 memory, all 1,024 shader units, and a custom cooler. There are, however, some compromises. The core clocks are set to 607MHz—substantially down from the 772MHz of the reference GTX 580 or the 787MHz of the EVGA GTX 580 SC. Memory clocks are lower, too, at 853.5MHz, versus 1,002MHz on the stock GTX 580. The lower memory clock is mitigated somewhat by the 384-bit memory bus.

We got our hands on Asus's retail version of the GTX 590, which essentially runs at stock speed. Nvidia put some serious engineering effort into the GTX 590's cooling solution. Like the HD 6990, the GTX 590 uses a central fan surrounded by dual heatsinks. The company estimates the card to be roughly 6dB quieter than the HD 6990 at full load. We could certainly hear the fan spin up significantly during benchmark testing, but it never became annoyingly loud. Even with the quieter cooling solution, the card is just 11 inches long—a full inch shorter than the HD 6990. That said, anyone who buys a dual-GPU card should understand the need for a large chassis with robust cooling.

The GTX 590's 165MHz reduction in core clocks compared to a single GTX 580 is pretty hefty—especially considering that the Radeon HD 6990's two GPUs run just 50MHz slower than a single 6970. Even then, AMD offers a one-button solution to pump clock speeds back up to single-GPU territory, albeit at some risk to the user. We tested the GTX 590 against a single-GPU GTX 580 and the Radeon HD 6990 reference card running at default (not overclocked) speeds and wondered if what amounts to dual 580s would win.

Surprise, surprise: It was pretty much a dead heat between the two dualies. If anything, the HD 6990 fared better, with wins in six of 12 benchmarks and draws in two more. When the GTX 590 won, though, it was generally by wide margins.

Power consumption is interesting, too. Both cards need dual 8-pin PCI-E connectors, but the GTX 590 is more power hungry than the HD 6990 reference card, both at idle and full throttle. It's clear from the power consumption numbers why Nvidia needed to drop the core clocks so much: Pushing clock speeds much higher might result in a power supply meltdown. Asus will ship its GTX 590 with the SmartDoctor overvolting utility, but we didn't get it in time for our tests. Given that the card already needs dual 8-pin connectors and sucks vast amounts of current at full load, the thought of pushing the card harder gives us the willies.

In the end, the GTX 590 seems unfinished, as if it were rushed out in response to AMD's HD 6990. It's not quite as speedy in many games as the HD 6990, though it certainly performs up to snuff. It's quieter and a little more compact, which are positive attributes. But when you're spending this kind of cash on a high-end card, raw speed matters more than good manners.

—LOYD CASE

SPECIFICATIONS

	Asus GTX 590	Radeon HD 6990	EVGA GTX 580 SC
Shader Units*	1,024	3,072	512
Texture Units	128	192	64
ROPs	96	64	48
Power Connectors	2x 8-pin	2x 8-pin	1x 8-pin, 1x 6-pin
Core Clock Frequency (MHz)	607	830 (std), 880 (OC'd)	797
Memory Clock Frequency (MHz)	854	1,250	1,012
Frame Buffer Size	2x 1.5GB	2x 2GB	1.5GB
Memory Interface	384-bit	256-bit	384-bit
Video Connectors	3x DL-DVI,2x miniDP	1x DL-DVI,4x miniDP	2x DL-DVI,1x HDMI

** Nvidia and AMD shader units are not directly comparable.*

BENCHMARKS

	Asus GTX 590	Radeon HD 6990	EVGA GTX 580 SC
3DMark 2011 (Extreme)	2,661	**3,259**	2,021
3DMark Vantage Perf	**28,261**	27,495	23,888
Unigine Heaven 2.1 (fps)	**54**	50	36
Crysis (fps)	56	**61**	36
BattleForge DX11 (fps)	**147**	100	78
Far Cry 2 / Long (fps)	**149**	**149**	122
HAWX 2 DX11 (fps)	**186**	143	158
STALKER: CoP DX11 (fps)	86	**89**	58
Just Cause 2 (fps)	60	**71**	52
Aliens vs. Predator (fps)	67	**77**	44
F1 2010 (fps)	82	**87**	72
Metro 2033 (fps)	**39**	**39**	26
Power @ idle (W)	174	160	**141**
Power @ full throttle (W)	515	477	**395**

Best scores are bolded. Our test bed is a 3.33GHz Core i7-975 Extreme Edition in an Asus P6X58D Premium motherboard with 6GB of DDR3/1333 and an 850TX Corsair PSU. The OS is 64-bit Windows Ultimate. All games are run at 1920x1200 with 4x AA.

VERDICT 9

ASUS GTX 590

+ MARTIN SHEEN	− CHARLIE SHEEN
Excellent gaming performance; 3D Vision support; quieter than the competition.	Just a tad slower than the competition; seriously power hungry.

$700, www.asus.com

StreamHD Wireless PC-to-TV 1080p Display Adapter

Wireless video with surprisingly high quality

Last year, Warpia's Wireless PC-to-TV AV adapter convinced us that ultra-wideband was a viable means of wirelessly transmitting video, so we were enthused to hear about the company's StreamHD, which is capable of transmitting 1080p video from a PC to another display. We were even more enthused to find out that it actually works.

Much like last year's offering, the StreamHD consists of two parts. You plug a USB dongle into your PC, which communicates with a base unit that plugs into any display's HDMI port. After installation, Windows sees the Warpia-created screen as another display, meaning you can duplicate it, extend it, and rearrange it as you would with any extra screen. The StreamHD also transmits sound, which will automatically play via HDMI, but the base unit also has an optical-out port and a 3.5mm analog-out port so you can connect it to other sound devices.

So how does it all work out? Pretty great. We tested the Stream HD across a variety of system and room configurations involving laptops, desktops, projectors, and big-screen TVs. We tested the device in the Maximum PC Lab, a home office, and a fairly typical living room setup. In all cases, we found that the StreamHD not only works, but it works surprisingly well.

When we streamed HD videos from Vimeo's website in 720p to our Epson 1080p projector, we were surprised to find that the two versions were nearly indistinguishable from each other. There was a tiny bit more compression artifacting visible on the big screen, but you had to look carefully to find it. When we challenged the StreamHD by transmitting a Blu-ray rip of *V for Vendetta* from our laptop to a 46-inch LED display, we were pleasantly surprised. Yes, there was noticeable banding, particularly in dark scenes, but it wasn't anything near as bad as we expected. In short, it was watchable.

With fantasies of playing Total War: Shogun 2 on the big screen with no cables, we tested the StreamHD with gaming. This took a bit of Windows wrangling; we had to set our projector as our primary display, and even then we experienced bad enough flickering that the game was pretty much unplayable. Whether it's a driver issue, bandwidth issue, or simply some weirdness of trying to shunt the Direct3D stream to another device, we don't know. But we do know it doesn't work.

So you can't have it all, but we still consider the StreamHD an invaluable and convenient asset for tethering a PC to a big screen—or any size screen, for that matter. **–GEORGE JONES**

VERDICT 8

WARPIA STREAM HD

+ UPSTREAM	– DOWNSTREAM
Surprisingly high-quality video at 720p; decent quality at 1080p.	Some compression artifacting; advanced 3D games don't work.

$160, www.warpia.com



We found the StreamHD capable of transmitting video at distances of up to 22 feet with very little degradation or stuttering. The greater the distance, the more important line of sight is.

NZXT H2

Simple, affordable, quiet

NZXT's H2 is a simple-looking case—in fact, simplicity seems to be the overall theme—and that's not necessarily a bad thing. In the world of PC building, simple can be good.

The H2 is an ATX mid-tower, constructed of sturdy steel. The side panels (which lack windows or adornment of any kind) are lined with acoustic-dampening foam to keep your hardware quiet. It works well for the most part. We had the case running three fans, and the addition of the side and front panels made the case noticeably quieter.

The 8.5x18.3x20.5-inch chassis comes stock with a 12cm exhaust fan and two front-mounted 12cm intake fans, which are latched into the front of the case and use electrical contact points to connect with the fan power and control switch at the top of the chassis.

Eight toolless hard drive bays are accessed by removing one or both front intake fans, and the hard drive trays slide forward out of the front of the case. The front panel features snap-off bezels over the three 5.25-inch bays for easy and toolless optical drive installation.

The inside of the H2 is workable, though it felt a bit cramped for a mid-size case. Thanks to the way the hard drive bays are designed, long videocards, such as the Radeon HD 5970, can fit in the case, though you'll need to remove one or two hard drive trays to accommodate the longest cards. The three grommeted cutouts for internal case wiring are a cool addition, though they can be slightly difficult to access due to the confined space, and the rubber grommets tend to fall out of the cutouts easily.



Not impossible to build into by any means, but a little more cramped than we like.

Up top, the H2 doesn't disappoint, featuring a drop-down SATA dock, the standard audio inputs, three USB 2.0 inputs, and a single USB 3.0 input, as well as power and reset buttons. The USB 3.0 port uses a pass-through that will work with many boards but is unsightly compared to the few cases we've tested that are now using the new internal USB 3.0 header spec. There's also a nifty three-speed fan-control switch. The H2 accommodates an additional 12cm top fan behind the SATA dock. The case doesn't come with the fan, but it's nice to have the option. If you don't want to utilize the fan port, it can be covered with a magnetic fan cover that comes with the case.



The NZXT H2 has a very simple and, dare we say, classy design.

Ultimately, the H2 is a simple but solid case made more appealing by its super-low price tag. At just 100 bucks, you're getting a sturdy chassis with USB 3.0, a drop-down SATA dock, and an innovative fan configuration. Minor inclusions, like a slide-out dust filter below your PSU, and the aforementioned sound-dampening foam, are awesome additions for a case at the H2's price point—the Fractal Define R3, reviewed in the February issue, offered similar features but lacked USB 3.0 ports and fan control, and cost 10 bucks more. **—ALAN FACKLER**

VERDICT 8

NZXT H2

+ H2O	**− H2NO**
Really quiet; USB 3.0; three-step fan control; interesting fan config.	Kind of cramped; grommets aren't very secure; chintzy optical drive latches.

$100, www.nzxt.com

Corsair SP2200 Speakers

Whadaya want for less than a Benjamin?

Corsair blew our minds with its first speaker-building effort: The 2.1-channel SP2500 rocked hard. Now the company is back with a scaled-down system, the SP2200. This 2.1-channel set offers smaller and fewer drivers driven by a less-powerful amp. It also lacks the fancy tethered control module, but it's $150 cheaper than its sibling. Can Corsair wow us again?

Yes and no. This is one helluva speaker system for the money, but Corsair can't defy the laws of physics—or economics. The SP2200 uses a pair of bridged Class D amps to deliver 30 watts to the 6-inch paper driver in the ported subwoofer, while two independent Class D amps drive the 2-inch full-range paper drivers in the satellites with a modest eight watts each (46 watts in total). The satellites in the pricier SP2500 system are bi-amplified two-way speakers, with separate amps driving each tweeter and midrange (232 watts in total). The satellites in the SP2200 consist of full-range speakers, meaning a single driver in each cabinet is tasked with delivering the entire sonic spectrum (or at least all the frequencies above those assigned to the subwoofer).

That's a difficult task, and the SP2200's satellites tend to over-emphasize the mids and flatten the highs. Listening to Steely Dan's "What a Shame About Me," from the *Two Against Nature* CD, the hi-hat strike that starts this track lacked the bacon-grease sizzle that we hear from higher-end speakers. And when we played Peter Gabriel's cover of Paul Simon's "Boy in the Bubble," from his *Scratch My Back* release (sampled at 48kHz and encoded in 24-bit FLAC by B&W's Society of Sound music service), the speakers did a wonderful job producing the piano's lower register, but Gabriel's voice sounded as though he was singing from the bottom of a bucket.

While grooving to Tower of Power's "Squib Cakes" (from *Back to Oakland*), however, we had to keep reminding ourselves that we were listening to sub-$100 speakers. The SP2200 did an excellent job of distinctly rendering each individual instrument in the band's horn section, and preserving the tiny silences in between the attack of each note that reveal just how tight these musicians can play. But while the sub delivered deliciously taut bass response, the music still sounded constrained to the middle of the harmonic range. We really missed some of the nuances—the crack of a tightly wound snare drum, for instance—that high-end sound systems are capable of reproducing.

That level of fidelity isn't quite as important when you're playing games, because your attention isn't exclusively focused on sound when you're dodging enemy fire or crushing a zombie's skull. And the SP2200 delivered a great experience with Call of Duty 4 and Left4Dead 2, with thundering explosions, pounding gunshots, and bone-chilling screams from the horde without a hint of distortion—even with the volume dial turned hard right. The SP2200 boasts an off-the-chart price/performance ratio, but we'd happily pay more to get more. **–MICHAEL BROWN**

VERDICT 8

COSAIR SP2200 SPEAKERS

+ MIND-BLOWING	– MIND-BLASTING
Very inexpensive (but not cheap).	Truncated high-frequency performance and hardwired cables.

$90 (street price), www.corsair.com



Despite its ultra-low price tag, the SP2200 features four Class D amplifiers, two auxiliary inputs, and a headphone output. The satellites even have removable grills!

Samsung SyncMaster MD230X6

Best use of Eyefinity 6 technology yet

If a three-monitor setup is the ultimate display experience for gamers and power users alike, then a six-monitor setup should be twice as excellent, right? This was the assumption we were working under when Samsung offered us the chance to give its MD230X6 six-panel display a spin. Note: This beastly configuration needs to be paired with an AMD videocard that has Eyefinity 6 support, such as the Radeon HD 5000 series and the HD 6850 and HD 6870 models.

The six monitors are 23-inch screens with 1920x1080 resolutions, each set in a remarkably thin bezel and capable of both landscape and portrait configurations. Tabs on the backs of the monitors let you connect them to each other as well as to an included stand. The outside panels can be tilted inward roughly 30 degrees or so to provide an encompassing gaming experience, and the entire display can be adjusted for height. However, due to its sheer size, there is some unavoidable wobble.

Setting up the six panels was relatively painless (though definitely a two-person job), requiring nothing more than screwing the panels to the frame and then to each other. However, the rest of the setup took some trial and error—with each monitor possessing its own power supply, input (DisplayPort or DVI), and USB cable for daisy-chaining, the rear of the MD230X6 is a cable-management nightmare. Also, as none of the monitors have any controls save a power button, you're left to rely entirely on the USB-attached remote, which means you'll need to pay really close attention to how the panels are daisy-chained together, lest you don't have access to the menus and controls on some of them.

Although Samsung included extensive instructions detailing how to assemble the physical build of the display, it included zero information regarding the software side. You need to configure how the screens work together in AMD's Catalyst Control Center, and the process is not straightforward. After reseating the videocard, downloading drivers, configuring screen resolutions, and several attempts at various options in the Catalyst Control Center, we finally got all six monitors identified and properly configured. For the record, you'll need to go to Create and Arranging Desktops under the Desktop Management menu, then use the drop-down menu in the corner of the display to Create Group.

Once set up, we immediately started gaming, the obvious application for the MD230X6. Games looked stunning at the display's combined 5760x2160 resolution, although the bezel—thin though it is—running through the middle of the display can be a nuisance, particularly in first-person shooters, where it gets in the way of aiming. In Need for Speed, on the other hand, the display did an amazing job, providing a spectacularly immersive experience.

Playing Blu-ray movies across six screens highlighted a significant shortcoming of Blu-ray: not enough resolution. Remember, you're taking a 1920x1080 source and stretching it across six panels. The result looks like, well, DVD. We watched 4K resolution material, which was an improvement, but even that was too low-res. Yes, too low-res. Again, the bezels proved a distraction, as faces were strangely broken up by the bezel lines. Light leakage in each corner of the individual panels was a bigger distraction.

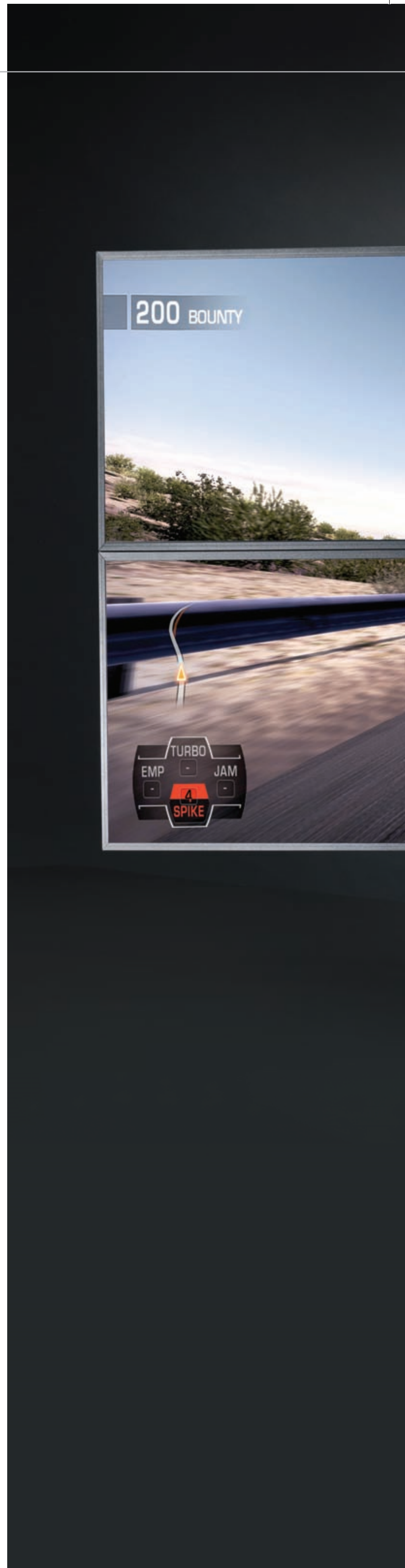
Overall, the MD230X6 held steady through most of our DisplayMate testing, producing strong detail and good black levels, although we did observe some compression banding. Individually, the screens are nothing special, and maybe even a little underwhelming. But combined, they make a jaw-dropping display, so much so that we really wanted to love the MD230X6—and we did, for certain games. Trouble is, bezel issues with first-person shooters and unimpressive movie performance keep it from completely winning us over. **—AMBER BOUMAN**

VERDICT 7

SAMSUNG SYNCMASTER MD230X6

+ JACK BAUER	– JACK IN THE BOX
Spectacular for certain kinds of games.	Distracting bezels; expensive; can be difficult to configure.

$3,600, www.samsung.com





You'll need a lot of sturdy desk space to support the Samsung MD230X6.



A wired USB remote is about as high-tech and fun as a wired "remote controlled" car.



You may need Harry Tuttle himself to help you tame the number of cables involved in a six-panel setup.

Asus RT-N56U Dual-band Wireless Router

Garish or glam? We report, you decide

We don't much care what our routers look like, because they're usually hidden inside a closet (unless we're benchmarking them). But Asus's engineers lavished as much attention on the RT-N56U's skin as they did its guts: This dual-band router is a looker, and it's also pretty damned fast.

The RT-N56U is nicknamed "Black Diamond" for its embossed, shiny black plastic housing. In addition to speed, it delivers excellent range and a good collection of features. It's missing one very important feature, however: It doesn't provide a guest network on either its 2.4GHz or 5GHz radios. It does offer two USB ports (to support both a printer and an attached storage device) and support for WDS bridging (you can turn off its router function and use it as a wireless bridge). Alternatively, you can configure the router as a wireless access point. The Black Diamond's graphical user interface renders any setup easy.

When we plug a USB hard drive into all too many routers, we find that the port doesn't deliver enough juice to spin up the drive's platters. Our long-time favorite, Netgear's WNDR3700, proved guilty of this when we connected a Verbatim Clon drive (which is based on a 2.5-inch 500GB Samsung mechanism). The RT-N56U has no such problem; it can deliver up to 30 watts of power through its USB ports.

The paper-thin router comes with a stand that puts it in a vertical orientation, with its Gigabit modem port and four Gigabit Ethernet ports facing right (that's how we tested it), but it can just as easily lie flat as a pancake on a shelf or your desk with its ports facing the wall.

We've changed our benchmarking procedures so that the JPerf app running on the server produces four simultaneous wireless TCP streams to simulate four wireless clients. It's not a perfect simulation, because one wireless adapter is juggling all four streams, but it does a much better job of revealing the router's throughput limits than our previous single-stream test did. As you can see from our benchmark chart, Netgear's WNDR3700 2.4GHz radio spanked the RT-N56U in our Bedroom and Kitchen tests, where the client is closest to the router (10 and 20 feet from the router, respectively). The Asus returned the favor in our Patio, Bedroom 2, and Outdoor tests, crushing the Netgear when the client is much further from the router (38, 60, and 85 feet, respectively).

Both routers delivered roughly the same performance on the 2.4GHz band with the client in our difficult-to-penetrate home theater. The Netgear was faster on the less-crowded 5GHz band, and significantly faster on this band in the home theater. The client wasn't able to connect to either router's 5GHz radio when the client was at its furthest outdoor location.

The RT-N56U is a strong performer—its 2.4GHz radio delivered fabulous throughput at range—and it has some great features. Whether you think it's pretty or pretty ugly, there's no question that it would be a better value if at least one of its radios supported a guest network. –MICHAEL BROWN

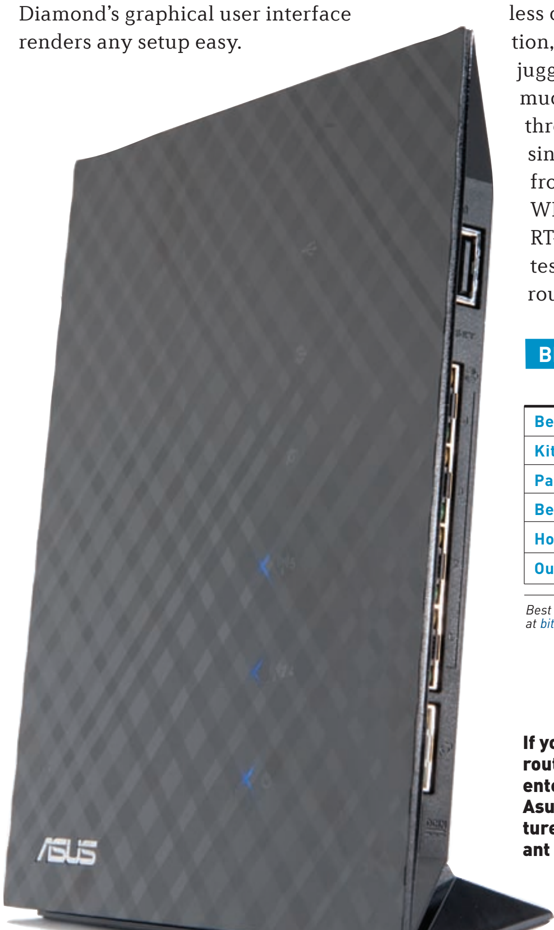
SPECIFICATIONS

Radio Frequencies	Concurrent dual-band: 2.4GHz and 5GHz
Guest Network	No
DLNA-compliant Media Server	Yes
USB Ports	Two (for printer and/or storage)
NTFS Drive Support	Yes
WDS Bridge/ Repeater Support	Yes

BENCHMARKS

	Asus RT-N56U 2.4GHz	Netgear WNDR3700 2.4GHz	Asus RT-N56U 5GHz	Netgear WNDR3700 5GHz
Bedroom 1, 10 feet (Mb/s)	72.5	**148**	80.8	**97.2**
Kitchen, 20 feet (Mb/s)	74.9	**133**	**86.3**	70.2
Patio, 38 feet (Mb/s)	**66.9**	43.1	**74.0**	73.5
Bedroom 2, 60 feet (Mb/s)	**56.2**	42.6	41.7	**47.8**
Home Theater, 35 feet (Mb/s)	31.6	**33.5**	9.98	**24.2**
Outdoors, 85 feet (Mb/s)	**13.7**	3.13	N/C	N/C

Best scores are bolded. TCP throughput measured using JPerf. N/C indicates no connection at that location. Additional benchmarking methodology at bit.ly/16w270.



If you're looking for a router to support your entertainment system, Asus's RT-N56U features a DLNA-compliant media server.

VERDICT 8

ASUS RT-N56U DUAL-BAND ROUTER

+ BLACK DIAMOND	– BUNNY SLOPE
Great long-range performance on the 2.4GHz band; dual USB ports; very good GUI.	No guest network; meh short-range performance on the 2.4GHz band.

$130 (street price), www.asus.com

Razer Naga Epic

A premium MMO gaming mouse that takes time to master

With the introduction of the Naga Epic, Razer has split its highest gaming mouse tier into two segments. The Mamba is still the top-of-the-line general-purpose gaming mouse, but it's now joined by the Naga Epic, which runs the same high MSRP ($130) but offers features more tailored to MMO gamers. That's a lot of cash—is the Naga Epic worth it?

The Naga Epic packs many of the same "elite"-level features as the Mamba, including a 5,600 dpi laser sensor, a 1ms response time, and responsive hybrid wireless/wired control. Build quality is solid, as usual, and custom-color backlighting shines through the scroll wheel and thumb grid.

So what sets the Naga apart as an MMO gaming mouse? First, there's the shape: a higher-backed, more bulb-shaped design than you normally expect from Razer. If the Mamba is a Corvette, the Naga is a VW Bug. It's a comfortable layout that leaves your hand in a more relaxed position for long gaming sessions. The Naga Epic has a degree of physical customization as well, in the form of three swappable pinky-side plates that let you change the feel and look of the mouse. The plates feel sturdy while in place, and are well designed; the mouse looks very nice with any of the three attached.

The second thing that makes the Naga Epic suited for MMO gamers is the 12-button side plate, which puts an incredible number of potential hotkeys right under your thumb. Razer's excellent driver software makes it easy to customize the 12 buttons, allowing you to save different profiles for different games. To help you "train" on the 12-button grid, Razer includes sheets of adhesive, rubbery dots so you can feel your way around. Unfortunately, we found that even with the dots, it takes a lot of effort to become adept at finding the right spot on the Naga Epic's tightly packed grid.

So, as a top-tier MMO gaming mouse, we can recommend the Naga Epic. It's a comfortable mouse with a strong feature set, including a staggering number of buttons—if you're willing to put in the time needed to learn to use them. **—ALEX CASTLE**

RAZER NAGA EPIC — VERDICT **8**

+ TOUCH-TONE	− ROTARY
5,600 dpi laser sensor; hybrid wireless/wired design; tons of buttons.	Buttons take practice to use; no onboard memory; pricey.

$130, www.razerzone.com



No, you're not hallucinating. The Naga Epic has more buttons than a touch-tone phone.

Homefront

Home, but no heart

Homefront can best be summed up by its opening (which is nice, because that means you don't have to play much of the game). You're kidnapped and tossed aboard a bus, at which point you get to witness the ugly carnage of Korea's invasion right in front of your face. Or maybe "in your face" is the more apt term, as the game immediately balks at the notion of subtlety. Senseless shootings. Dead bodies cluttering the streets. Parents brutally murdered as their child cries in terror. And this all happens within the first five minutes or so. It's loud, it's upsetting, and yet—somewhat shockingly—it's incredibly difficult to care about.



And here are our pals: her, that guy, and, uh, him.

Homefront's many problems are splotchy boils on the face of some fairly interesting ideas. The game's basic premise, of course, is that North and South Korea have united to—among other things—invade North America, but the circumstances leading up to it are downright laughable. Still though, during the rare moments when the game takes a chill pill and stops screaming spittle in your face, it's capable of displaying some pretty striking imagery. Ramshackle refugee hideouts, especially, create an almost believable counterpoint to the game's otherwise comical ludicrousness. Environments in general have a very beaten, broken, lived-in feel to them, oftentimes whipping up a multicourse feast for the eyes.

Problem is, actually *being* in those environments isn't all that enjoyable. We're not going to beat around the bush: Homefront is Call of Duty, but often even blander and more vapid. Generally, levels see you running between barely disguised infinite spawn points, playing hide-and-go-headshot with your faceless foes, and then waiting for your burly commander to tell you what you're allowed to do next. And believe us, the extent to which Homefront goes to make you feel like you don't matter is nearly infuriating. You can't climb ladders without this man's permission. Seriously.

Speaking of your burly leader man, that's the other reason Homefront falls on its face: characters. More to the point, it has none. Just war-shooter archetypes doing exactly what you'd expect. The effect, then, is that it's very difficult to care. Sure, you're fighting to save America, but there's more to compelling emotional investment than plastering every open space with billowing U.S. flags. Moreoever, the game harps on and on about how the mean ol' Korean boogeymen dehumanize Americans, yet treats the Koreans like inhuman murder machines in the process. Pot, meet kettle.



Setpieces like these really are impressive. Shame there aren't more of them.

Multiplayer, fortunately, fares much better and even manages to bring the genre forward a couple small steps. Battle Points, for instance, offset XP-based shooters' "longtimers have the best stuff" mentality by providing a mid-match currency for you to earn and spend. Also, racking up kills actually puts an XP bounty on your head, which makes dealing with Captain FPS Demigod a bit more interesting for all involved.

Beyond that, however, it's fairly unremarkable, which is also a pretty nice summary of the game as a whole. It has its little glimmers of intrigue, but by and large, it's just another sheep in the herd trailing behind Call of Duty. Yes, you could certainly do worse than Homefront, but you could also do much, much better. **—NATHAN GRAYSON**

HOMEFRONT — **VERDICT 5**

+ HOMESTAR RUNNER	− HOME ALONE 3
Interesting concept; a few well-constructed environments; decent multiplayer.	Poorly paced linearity; no interesting characters; bland levels and shooting.

$48, www.homefront-game.com, ESRB: M



The fight shifts from an island in Crysis to the urban playground of New York City.

Crysis 2

The suit makes the man

You can take Crysis out of the jungle, but you can't take the jungle out of Crysis. For those worried that Crysis 2's city-slicking setting would turn it into a cramped corridor crawl, go ahead and activate strength mode, grab your fears, and ragdoll them 30 feet in the air. Crysis 2—while not quite as open as its predecessor—is subtly complex, brilliantly paced, and morbidly satisfying from start to finish. Sure, it's far from revolutionary, but sometimes, you just want to put on a talking suit and shoot squid monsters, you know? OK, that made more sense in our heads. Allow us to explain.

Crysis 2 throws you headlong into a tale of military in-fighting, invasion clichés, and whiny scientists crying into your ear that's, well, honestly kind of terrible. But that's not the point. The nanosuit has always been the Crysis franchise's real main character, and this time around it's quite apparent that Crytek knew that. The end result, then, is a stylish piece of sci-fi chic that—while at first glance appearing "dumbed down"—has been expertly refined. Now you have two central modes to aid in your almost unfairly one-sided manhunts: stealth and armor. That doesn't mean your old pals strength and speed have abandoned you, however. Rather, Crytek has decided that there's something to that whole "making sense" idea that everyone's always talking about, so speed is now rolled into your normal sprint, and holding down your melee attack automatically gives you a hulked-out variation on the theme. All told, the new approach is even more empowering because picking a central mode is now a snap decision. One or the other: no more fumbling through superfluous nonsense. As a result, tailoring your play style to the task at hand quickly becomes second nature.

The Crysis franchise's other main pillar—largely open level design—holds up its end of the bargain in a similar fashion, sacrificing a bit of freedom for a pace that makes the game nearly impossible to put down. So yes, we encountered a few "if only there wasn't an invisible wall here…" moments, but they were far outweighed by a fusion of smart, sparingly applied scripting and impromptu chaos. Combat, you see, isn't quite like anything else on the market. In Crysis 2, you're neither Rambo nor Solid Snake. The nanosuit's limited energy capacity doesn't allow it to go all-in with either, so hit-and-runs are your best option. And that's

the beauty of it. Any enemy, alien or human, can and will kill you if they catch you with your superpowered trousers down, and that element of real danger ensures that you never feel like a bored child stepping on ants. Instead, you're a mighty hunter—easily at the top of the food chain—but your prey's no slouch, either. And even though levels are more confined, they're no less varied, managing to be both hauntingly beautiful and suitably vertical.

Then again, given the franchise's history, that's not exactly shocking. On the "pleasant surprise" end of the spectrum, meanwhile, is Crysis 2's multiplayer. Again, the nanosuit's the star of the show here—especially in modes like Assault, where one team doesn't have nanosuits at all, but makes up for it with better weaponry. Other than that, Call of Duty's the obvious inspiration (gain XP, unlock weapons/attachments, etc.), but Crysis 2's superpowered shenanigans put it near the front of that particular pack.

That's not to say, however, that Crysis 2 is without flaws. Foremost, the game chose to stick with an antiquated autosave system that'll turn your smile into a scowl faster than you can say, "But I played this area, like, 20 minutes ago." Also, enemies—while generally the ShamWows of brutal bullet-sponging—occasionally suffer from AI brain farts, resulting in staring contests with walls and the always comical, "Oops, I guess it was just a false alarm," when you're standing two feet away from the enemy. The game's graphical customization options, meanwhile, are shockingly limited compared to other PC games, presenting you with literally four options and nothing else.

All told, however, Crysis 2 is an extremely empowering action-fest that absolutely deserves your attention. It's a game that sprinkles creativity and planning atop a heaping helping of chaos, and during this age of mindless Call of Duty clones, it's exactly what the doctor ordered.

—NATHAN GRAYSON

MAXIMUMPC KICK ASS!

CRYSIS 2

VERDICT **9**

+ TEARS OF JOY	**– MID-LIFE CRISIS**
Nanosuit's better than ever; surprisingly enjoyable multiplayer.	Frequently lousy checkpoint system; occasionally brain-dead enemy AI.

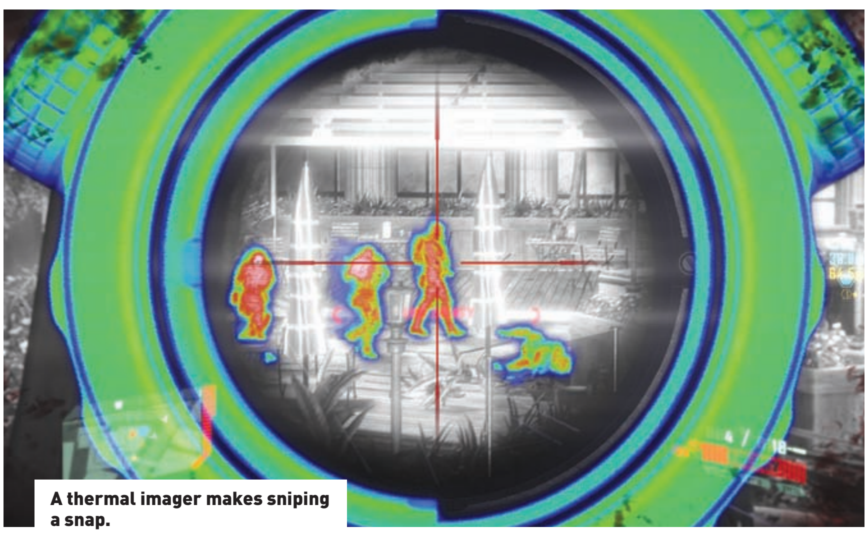
$59, www.ea.com/crysis-2, ESRB: M



Deformable environments change dynamically during gameplay.



You'll go through numerous weapon changes throughout the game.



A thermal imager makes sniping a snap.

LAB NOTES

Remote Your PC

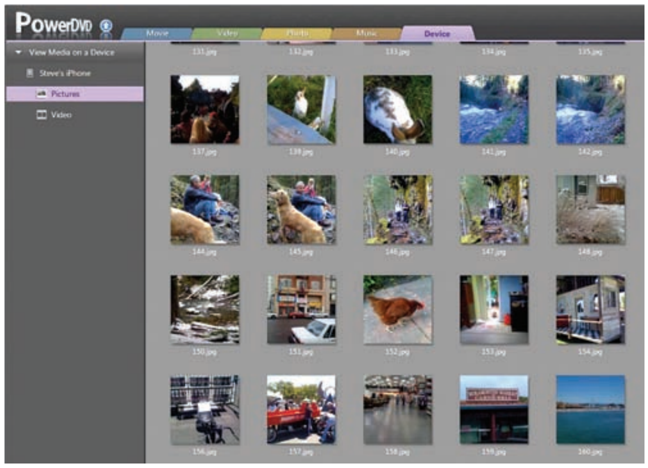
Using your phone to control your computer is becoming mainstream



GORDON MAH UNG
SENIOR EDITOR

If you're like me, you probably have a box of various PC-component remotes that you no longer use. With the ubiquity of smartphones, though, we may have finally found the ultimate remote control for a PC. Imagine coming home from work, and instead of walking over to your PC to hit the power button, you whip out your phone. If your PC has an Asus board with a Bluetooth receiver, you can remotely boot the machine.

For media chores, PowerDVD 11 now supports remote control using an iPhone or Android-based smartphone. The app is available for free in both app stores. You can use it to start and stop a legacy-disc movie or to play back any video, music, or still photo that's in PowerDVD's media manager. Far cooler, however, is the ability to actually stream photos and video from your phone to your PC. PowerDVD 11 will even do a fairly decent slide show of the photos directly from your phone. You'll have to be on a Wi-Fi network but it's fairly nifty.

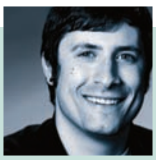


PowerDVD 11 lets you stream pictures and videos from your phone to your PC.



AMBER BOUMAN
ONLINE FEATURES EDITOR

As summer nears, I'm starting to amass a pile of monitors for review. Currently, I've got my hands on four displays: NEC's new 30-inch PA301W, one of AOC's Aire Black lines (e2243Fw), a 3D display from BenQ (XL2410T), and LG's high-end E2370.



NATHAN EDWARDS
SENIOR ASSOCIATE EDITOR

With three fresh Marvell 9174 SSDs (figuratively) under my belt, I feel like I have a decent handle on the platform's performance. I look forward to more new SandForce drives; then I'll be able to tell whether the OCZ Vertex 3's spectacular performance is a fluke or not. These new drives have me seriously considering moving to a platform with native 6Gb/s SATA. X58, you're a heartbreaker.



GEORGE JONES
EDITOR-IN-CHIEF

I'm picking up the all-in-one PC beat—I have two systems in hand that I'll be reviewing next month. It's still shocking to me that neither can run current 3D games with any muscle, particularly given the power of the laptops we regularly test. There has to be someone out there making gaming all-in-ones. I won't rest until I find one.



ALEX CASTLE
ONLINE MANAGING EDITOR

This month I finally got around to playing Super Meat Boy, the indie hit platformer. It's an awesome game, but I'm pretty sure it's a health hazard. I figure that I'm either going to get an aneurysm from frustration or tendonitis from trying to play it on a keyboard. That decides it—next month I'm reviewing a game controller!



KATHERINE STEVENSON
DEPUTY EDITOR

Don't you hate it when you're typing on a notebook and your cursor randomly jumps around on the screen for seemingly no reason? It's usually the result of inadvertently tapping the trackpad with your palm. If the notebook has a Synaptics pad, you can fix this issue by going to Device Settings, then Settings, and moving the slider for PalmCheck toward Maximum.

We tackle tough reader questions on…

‣The $647 PC

‣Microstutter

‣SIP vs. PBX

Missing Mobo

Why is there no LGA1155 motherboard on your Best of the Best list?

—Steven Zore

Senior Editor Gordon Mah Ung Responds: We pulled our LGA1155 in the midst of the Sandy Bridge chipset issue. While it looks like the problems are all but over, we didn't know how long the chipset drought would last. You'll find that the LGA1155 board is back on our list once again this month.

Rethinking the $647 Build

In your February 2010 issue, you built a $647 computer that was fast. What would you change today, one year later?

—Aransome

Senior Editor Gordon Mah Ung Responds: My initial thought is to replace the Athlon II X4 we used back then with a dual-core Sandy Bridge Core i3 part. The Athlon II X4 is still generally faster at applications that are threaded for quad-cores—but not always. In many media apps that are multithreaded, the dual-core Sandy Bridge part runs faster due to its more efficient cores. (The Phenom/Athlon II is still an Athlon 64, albeit a generally faster derivative.) In a showdown of 23 benchmarks, the Athlon II X4 630 is faster in only four: HandBrake conversions (big win), Cinebench 11 (minor win), Fritz Chess Benchmark (moderate win), and Valve Map compilation (moderate win). More importantly, in gaming, the Core i3 is far faster. Unless you are doing a lot of HandBrake conversions where the quad pays off, a Sandy Bridge system is the way to go.

I started poking around Newegg with an eye toward building a new low-cost system reusing some of the parts from last year's $647 build, and it turns out that you can build a pretty nice rig for $667 after rebates. Besides the Core i3, this rig would include the much faster Radeon HD 6850 card, a 1TB drive, and even OEM Win7 HP. That's a hell of a big jump over the storage, graphics, and CPU in last year's machine, and is about as cheap as you can get with Sandy Bridge. Keep in mind: The build has a budget case and power supply. Those are the parts that always get squeezed when the budget gets cut. Frankly, I'd rather have a nicer case and spend more on a power supply, but if you can't, these parts will still serve you well.

Microstutter

It's pretty apparent that an SLI or CrossFireX setup is the way to go. However, I've heard stories about microstutter. I'm building a new rig and want to see if this will affect me, but I can find no reliable data about the seriousness of this problem. I primarily play multiplayer shooters online, and I do extreme things, like playing on a direct connection to eliminate any latency. Will I notice microstutter or will it affect online play? Also, is it true that with a dual-GPU setup, the benchmark reads 90fps, yet in reality one only gets 45fps?

—Louis

Senior Associate Editor Nathan Edwards Responds: Microstutter (when the frame rate dips in multi-GPU systems as a result of cross-rendering) is highly application-dependent. If you see it at all, it will probably only be in a few games that don't natively

NOW ONLINE

33 Key Stages in the Evolution of (Virtual) Mankind

The visual quality of 3D games has come a long way over the last 15 years, and with it the quality and relatability of the characters in those games. From the sprite-based pseudo-3D characters of Wolfenstein to the blurry-brown blobs of Quake to the scary-sharp soldiers of Crysis, the virtual human has undergone a startling transformation. Check out our gallery of 33 of our favorite characters from the history of 3D games, used to illustrate the spectrum of (virtual) human evolution. bit.ly/gxOu2a



support multi-GPU rendering, and often the problem is solved with updated drivers or application profiles. The few times we've heard of it recently, the problem has been mitigated by turning on triple buffering. And no, we do not know of benchmarks that report the frame rate for a dual-GPU setup as being faster than it really is; if you've found a benchmark that reports 90fps but is actually running at half that, we'd love to hear about it.

UNLESS YOU'RE DOING A LOT OF HANDBRAKE CONVERSIONS, A SANDY BRIDGE SYSTEM IS THE WAY TO GO

SIP or PBX?

Regarding your article on setting up a PBX for Google Voice ("Cheapskate's Guide," April 2011), I have to ask why you don't just buy a SIP phone ($60 – $400) and connect it to your router? Then you can subscribe to one of the many VoIP online services that give free PC-to-PC / VOIP-to-VOIP calling, and map this into Google Voice to get access to all U.S.-based phones. I see that working for incoming calls just fine, but I don't fully understand how the outgoing calls work. Can you offer any clarification?

—John Casey

Contributing Writer Bruce Atherton Responds: Sure, you can connect a SIP phone to a VoIP provider, but in our opinion that is just substituting one phone company for another. For real power you need to turn your computer into its own phone company. Many of the mom and pop VoIP providers run their businesses on a server like Asterisk. Our story offered several examples of the power a phone server gives you that no phone company can offer. Here is another: dealing with telemarketers. You can set up a dial plan that can send the tones that indicate a line is out of service. Autodialers that receive it will put your number on their no-call list. Or use Asterisk's recording: "All representatives of the household are currently assisting other telemarketers. Please hold and your call will be answered in the order it was received." Then send them to custom on-hold music: a rick-roll, William Shatner's greatest hits, or worse.

Using Google Voice with a SIP phone for outgoing calls is problematic. Google Voice is based not on SIP but on XMPP, which means you need something to translate between protocols, something your VoIP provider probably doesn't do. One solution that doesn't require a phone server is the Obihai OBi110 ATA. You can also use it with a phone server for a simple-to-install Google Voice trunk.

PlayOn for Streaming

In your "Ultimate Guide to Digital Media" (May 2011), you missed an extremely useful program that installs in Windows and streams Hulu, YouTube, podcasts, and Internet TV to any current game console, thus giving you everything except a web browser on your HDTV. The program is called PlayOn and it's worth every penny—$5 per month, $40 for a year, and $80 for a lifetime subscription.

—Keith Brooks

No Love for Linux?

Why on earth are you guys advocating Windows 7 in "The Cheapskate's Guide" in the April 2011 issue? Ubuntu Linux is free and IMHO a superior operating system to Windows, while being just as easy to use.

—Jason Todd

Editor-in-Chief George Jones Responds: There's one simple reason we personally prefer Windows, and that's games. We have nothing against Ubuntu, but it just doesn't have adequate game support.

LETTERS POLICY Please send your questions and comments to comments@maximumpc.com. Include your full name, city of residence, and phone number with your correspondence. Letters may be edited for space and clarity. Due to the amount of mail we receive, we are unable to respond personally to all queries.



NEXT MONTH

COMING IN **MAXIMUM PC'S** LOUDER THAN A BOX OF CHERRY BOMBS JULY ISSUE

Email Mastery

Raise your hand if a greater portion of your life than you'd like revolves around email. Raise your hand if you'd like to become a stronger, faster, and smarter emailer. Your wish will be granted next month.

Small Form Factor Shootout

Gordon Mah Ung is currently in the possession of five super-powerful and super-tiny systems from the top PC manufacturers. Tune in next issue to see the latest in SFF design and performance.

Multi-Display Challenge

Amber Bouman's review of Samsung's six-screen Eyefinity display got us thinking about a slew of other multi-screen options. We're going to test four distinct setups with an eye toward identifying the optimum configuration.

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SOLID-STATE DRIVE

OCZ Vertex 3 240GB

The first SandForce SF-2200–powered SSD we were able to get our hands on is also the fastest SSD we've ever tested. With average sustained-read speeds exceeding 500MB/s and average sustained writes around 280MB/s, the Vertex 3 really takes advantage of the 6Gb/s SATA bus. Its random reads and writes don't disappoint, either; only the PCI-E RevoDrive X2 scored higher in our Iometer test. If you've got native 6Gb/s SATA on your motherboard, you should get a 6Gb/s SATA SSD. And right now the Vertex 3 is the best 6Gb/s SATA SSD on the market. www.ocz.com



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■ High-End Cooler
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■ Water Cooler
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■ Blu-ray Drive
Plextor B940SA
www.plextor.com

■ Full-Tower Case
Corsair 800D
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■ Mid-Tower Case
NZXT Phantom
www.nzxt.com

■ Wi-Fi Router
Netgear WNDR3700 V1
www.netgear.com

■ Speakers
Corsair SP2500
www.corsair.com

■ Gaming Mouse
Madcatz Cyborg R.A.T.7
www.cyborggaming.com

Games we are playing

■ Total War: Shogun 2
www.totalwar.com

■ Call of Duty: Black Ops
www.callofduty.com/blackops

■ Dead Space 2
www.deadspace.ea.com

■ Super Meat Boy
www.supermeatboy.com

For even more Best of the Best entries, such as speakers and budget components, go to http://www.maximumpc.com/best-of-the-best.

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